Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

OFFICE OF MANAGEMENT SERVICES
DBF - BUDGET BRANCH
CENTRAL FILES

DSF BUDGET BRANCH

VOLUME NO. 1
(Pages 1 to 191, inclusive)

Includes the following Bureaus and Offices:

	Pages
Office of the Secretary	1 - 15
Office of the Solicitor	16 - 18
Office of Information	19 - 30
Library	31 - 32
Office of Experiment Stations	33 - 47
Special Research Fund, Department of Agriculture	48 - 50
Extension Service	51 - 78
Weather Bureau	79 - 92
Animal Industry	93 - 122
Dairy Industry	123 - 135
Plant Industry	136 - 191

U. S. D. A.
National Agricultural Library
Received
Procurement Section
Current Serial Records

--oOo--

EXPLANATORY NOTES

OF

INCREASES, DECREASES, AND CHANGES IN LANGUAGE

IN THE BUDGET FOR THE

DEPARTMENT OF AGRICULTURE

FOR THE

FISCAL YEAR ENDING JUNE 30, 1937

AND OF

WORK DONE UNDER EACH OF THE APPROPRIATION ITEMS

52234

I N D E X

(Volume 1)

	Pages
OFFICE OF THE SECRETARY:	
Salaries, Office of the Secretary	1 - 6
Quarters, heat, and light allowance authorizations.	6 - 8
Miscellaneous expenses, Department of Agriculture .	9 - 13
Rent of buildings in the District of Columbia . . .	13 - 14
Emergency funds	15
OFFICE OF THE SOLICITOR:	
Salaries and expenses	16 - 17
Emergency funds	18
OFFICE OF INFORMATION:	
Salaries and expenses	19 - 22
Printing and binding.	22 - 30
Emergency funds	30
LIBRARY:	
Salaries and expenses	31 - 32
Emergency funds	32
OFFICE OF EXPERIMENT STATIONS:	
Payments to States, Hawaii, Alaska, and Puerto Rico for agricultural experiment stations	33 - 38
Hatch act	34
Adams act	34
Purnell act	34
Hawaii station act.	34
Alaska station act.	34
Puerto Rico station act	34
Bankhead-Jones act.	35 - 38
Salaries and expenses:	
Supervision of and relations with agricultural experiment stations	39 - 42
Insular experiment stations	42 - 46
Hawaii station.	43 - 44
Puerto Rico station	44 - 46
Emergency funds	46 - 47
Passenger-carrying vehicles	47
SPECIAL RESEARCH FUND, DEPARTMENT OF AGRICULTURE:	
Administration of Sec. 5, Act of June 29, 1935 (Bankhead-Jones Act).	48 - 49
Special research projects, Department of Agriculture	49
Special research laboratories in major agricultural regions	49 - 50
Passenger-carrying vehicles	50

Pages

EXTENSION SERVICE:
Payments to States, Hawaii, Alaska, and Puerto Rico for agricultural extension work. . . . . 51 - 61
Supplemental Smith-Lever act. 57
Capper-Ketcham act. 58
Bankhead-Jones act. 59
Alaska station act. 60
Additional cooperative extension work 61
Salaries and expenses:
General administrative expenses 62
Farmers' cooperative demonstration work:
Regular appropriation . . . . . 63 - 65
Emergency funds (including allotments from AAA) . 65 - 70
Motion pictures 71
Agricultural exhibits at fairs:
Regular appropriation . . . . . 72 - 73
A Century of Progress (transfer from State) . . . 73
California Pacific International Exposition (transfer from Independent Offices) 73
Emergency funds 74
Cooperative farm forestry . . . . . 75 - 76
Cooperative agricultural extension work (permanent annual) 77
Emergency funds (bureau total). 78

WEATHER BUREAU:
Salaries and expenses:
General administrative expenses 79
General weather service and research. . . . . 79 - 88
Meteorological station, western Montana 88
Horticultural protection. 88
Aerology. . . . . 88 - 91
Emergency funds 92

BUREAU OF ANIMAL INDUSTRY:
Salaries and expenses:
General administrative expenses 93
Animal husbandry. . . . . 94 - 97
Diseases of animals:
Regular appropriation . . . . . 97 - 103
Emergency funds . . . . . 103 - 105
Eradicating tuberculosis:
Regular appropriation . . . . . 105 - 106
Emergency funds 107
Eradicating cattle ticks:
Regular appropriation . . . . . 107 - 108
Emergency funds 108
Eradicating dourine . . . . . 108 - 109
Hog cholera control . . . . . 109 - 110
Inspection and quarantine . . . . . 110 - 112
Meat inspection . . . . . 112 - 113

Pages

BUREAU OF ANIMAL INDUSTRY (Continued):
Salaries and expenses (Continued):
Virus-serum-toxin act 114
Packers and stockyards act. . . . . 114 - 116
Eradicating foot-and-mouth and other contagious diseases of animals 116
Emergency funds (including allotments from AAA) . . 117 - 120
Emergency funds - bureau total. 121
Passenger-carrying vehicles 122

BUREAU OF DAIRY INDUSTRY:
Salaries and expenses:
General administrative expenses 123
Dairy investigations. . . . . 124 - 134
Emergency funds 134
Passenger-carrying vehicles 135

BUREAU OF PLANT INDUSTRY:
Salaries and expenses:
General administrative expenses 136
Arlington farm. . . . . 136 - 137
Botany. . . . . 137 - 139
Cereal crops and diseases . . . . . 139 - 141
Cotton and other fiber crops and diseases . . . . . 142 - 144
Drug and related plants . . . . . 144 - 145
Dry land agriculture. . . . . 146 - 147
Experimental greenhouse maintenance 147
Forage crops and diseases . . . . . 148 - 151
Forest pathology. . . . . 152 - 154
Fruit and vegetable crops and diseases. . . . . 155 - 164
Genetics and biophysics . . . . . 164 - 165
Mycology and disease survey . . . . . 165 - 167
National arboretum:
Regular appropriation . . . . . 168 - 169
Emergency funds 169
Nematology. . . . . 169 - 171
Plant exploration and introduction. . . . . 172 - 174
Plant nutrition . . . . . 174 - 175
Plant reserve stations. 175
Rubber and other tropical plants. . . . . 175 - 176
Seed investigations . . . . . 176 - 178
Soil-fertility investigations . . . . . 179 - 180
Soil microbiology investigations. . . . . 180 - 181
Sugar-plant investigations. . . . . 181 - 183
Tobacco investigations. . . . . 184 - 185
Western irrigation agriculture. . . . . 185 - 186
Emergency funds (general) . . . . . 187 - 190
Emergency funds (bureau total). 190
Passenger-carrying vehicles 191

-oOo-

Project Statements

Following the custom of previous years, for the sake of simplicity and avoidance of confusion, "Project Statements" as shown in this book in general are limited to a breakdown of funds appropriated or allotted directly to the Department of Agriculture and do not include funds transferred from other Departments or establishments, although the latter are included in the Budget expenditure schedules under the items involved. The Project Statements printed in the formal Budget and reprinted in the Subcommittee Print include, in addition to the direct funds, projects dealing with funds transferred from other Departments -- for example, funds received from such agencies as the Navy Department or the Veterans' Administration, for the inspection of meats by the Bureau of Animal Industry, or the inspection of food and drug samples by the Food and Drug Administration. Where it is desired to examine a project statement which includes such transferred funds, therefore, reference should be made to the Project Statements in the Budget or to the Subcommittee Print.

OFFICE OF THE SECRETARY

(a) SALARIES, OFFICE OF THE SECRETARY

Appropriation Act, 1936.....$584,712 = 400,111
Budget Estimate, 1937..... 432,271
Decrease..... 152,441

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase or Decrease
Obligated:				
General administration (including offices of the Secretary, Undersecretary and Assistant Secretary).....	$69,459	$74,980	$74,980	----
Personnel administration and service (including divisions of appointments, salary classification, and investigations)..	65,026	79,920	90,640	+$10,720(1)
Budget and finance administration and service (including divisions of accounts, estimates and reports, purchase, sales and traffic, and bureau accounting service).....	133,084	144,680	160,880	+ 16,200(2)
General operations (including housing, mails and files, telegraph and telephones, property, emergency-room, post office, labor force, etc.).....	96,650	100,531	105,771	+ 5,240(3
Transferred to:				
Division of Disbursement, Treasury Department.....	34,038	-----	-----	-----
Procurement Division, Treasury Department.....	6,480	-----	-----	-----
"Miscellaneous Expenses, Department of Agriculture".....	7,442	6,200	-----	- 6,200(*)
"Salaries and Expenses, Office of the Solicitor".....	159,888	178,401	-----	-178,401(*)
Total obligations.....	572,067	584,712	432,271	-152,441(*)
Unobligated:				
Savings.....	534	-----	-----	-----
Total appropriation.....	572,601	584,712	432,271	-152,441(*)

*The decrease of $152,441 in this appropriation consists of an apparent decrease of $178,401, for salaries in the Office of the Solicitor, which is submitted as a separate item in the estimates for 1937, an apparent decrease of $6,200 due to the transfer of this amount, in the estimates for 1937, to the appropriation for Miscellaneous Expenses of employees engaged in motor transport operations, and an actual increase of $32,160, as follows:

(1) An increase of $10,720 for additional assistance in the Office of Personnel. The Office of Personnel includes the Division of Appointments, the Division of Classification, and the Division of Investigations. In this office all recommendations affecting the status of employees are reviewed to see that they conform to law and administrative policy before action is taken thereon by the Secretary. The increase requested includes:

(a) $5,600 for additional assistance for the Director of Personnel. An assistant at $3,800 and one clerk at $1,800 are needed to facilitate handling the large volume of personnel transactions resulting from the maintenance of a force of over 47,000 employees. The volume of these transactions has increased from 23,169 in the calendar year ended October 31, 1932 to 89,653 in the year ended October 31, 1935. In addition, during the latter year 21,696 transactions were required to comply with the Classification Act of 1923, as amended. The present personnel is inadequate for the most effective handling of this work.

(b) $5,120 for additions to the inspection and investigational force, including one senior investigator at $3,500 and one stenographer at $1,620. These employees are urgently needed to assist the present limited force in handling the increasing number of investigations which the Division of Investigations is called upon to make, involving personnel and fiscal irregularities and difficulties, violations of regulatory laws, etc., and in making periodical inspections of at least the more important field stations and offices with a view to discovering and preventing irregularities and inefficient administration. In order to be of maximum use investigators are in travel status a great part of the time and an increase of $1,500 for travel expenses for investigational work is requested under the appropriation for "Miscellaneous Expenses, Department of Agriculture."

(2) An increase of $16,200 for personnel in the Office of Budget and Finance. The Office of Budget and Finance includes the Division of Accounts, the Division of Estimates and Reports, the Division of Purchase, Sales and Traffic, and the Bureau Accounting Service, which performs regular bureau accounting work for a number of bureaus which maintain no bureau accounting office. In addition to the fiscal and accounting business, the Office of Budget and Finance is called upon to handle a large volume of business related to the general administration and operation of the Department. There is urgent need for more effective handling of both this and the fiscal work than can be accomplished with the present personnel. The increases requested for 1937 include:

(a) $11,200 for an additional assistant director of finance at $5,600, one administrative assistant at $3,800, and one secretarial stenographer at $1,800. These employees are needed in order to provide more adequate administrative, financial, and operating supervision of the Department as a whole, covering continuing study of the financial, business, and operating policies and procedures of the numerous branches of the Department, including the field stations, and for the improvement of these methods through the establishment, for the Department as a whole, of more orderly and economical, and

wherever possible, uniform, systems of operating procedure, including the development of adequate and more competent Departmental Administrative, Fiscal and Property Regulations. Among the specific items which need to be dealt with are accounting and other phases of expenditure control, both in Washington and at field stations, uniformity of accounts and records at field stations, uniformity in allowances to employees (other than salary), deductions from compensation for residences and other perquisites furnished, cooperative agreements and procedure thereunder, receipts of public money, purchasing policy and methods, property accountability and cost records for automotive and other heavy equipment and property of all types, coordination of construction work, and other similar items. More comprehensive study and consideration of budget estimates and financial plans relating to the Department also is needed. The budget and finance office also would be equipped to assist more effectively in bringing about the closer coordination to work involving more than one bureau of the Department.

The full time of the present Assistant Director of Finance is required for the handling of the strictly fiscal and accounting business of the Department, including the handling of the disbursing and other business with the Treasury Department and the General Accounting Office. Notwithstanding overtime daily and work on Saturdays and Sundays during the past two years the time of this officer is unavailable for the type of work for which additional assistance is needed, as described briefly in the foregoing. The size and complexity of the program of work and of the field service organization for which the Department of Agriculture is responsible makes it imperative, as a matter of administrative necessity, that additional personnel be provided for this type of work.

(b) <u>$5,000 for additional assistance to relieve serious congestion of work and provide for more effective operation of the Division of Accounts</u>, including one accountant at $3,200 and one accountant-bookkeeper at $1,800.

This Division maintains the general ledgers and other general accounting records of the Department, receives and handles all warrants, transfers of funds, allotments, etc., clears the vouchers and collections from the Department to the Treasury and General Accounting Office and prepares financial reports, cash withdrawal estimates, apportionments, etc., for the Treasury, the Budget Bureau and other agencies. While temporary assistance has been employed with emergency funds wherever the specific additions to the work made such charges proper, the general growth of the Department and the increasing complexity of government operation, the need and demand for more analytical financial reports and estimates, both special and regular, as called for in the Department and by the Treasury and the Budget Bureau, and the establishment of regional Treasury disbursing offices, have developed a situation which the present personnel is absolutely unable to meet and for which the additional employees are sought. The work can not be kept current with the present force working overtime regularly, and its character is such that serious consequences will result unless provision can be made for strengthening the force.

(3) An increase of $5,240 for additional assistance in the Division of Operation. This division is responsible for the management of the buildings and other facilities occupied or used by the Department in the District of Columbia, including the telephone and telegraph service, the mails and files, Department post office, motor transport service, engineering advice, emergency-room, building directory and information, labor force, and other service units, and for the personnel, financial, and budget work of the Office of the Secretary. In addition, the chief of the division, as real estate officer of the Department, reviews and passes upon applications by the several bureaus of the Department for the leasing of office, laboratory, storage, and other facilities and for the procurement of space in Federal buildings throughout the country. There is urgent need of additional assistance in handling the work of the division, and the following increases in personnel are requested:

(a) $2,000 for an additional clerk, qualified as a draftsman, in the Buildings Section. The head of this section, who is qualified as an engineer, supervises the installation of new equipment and the repair and servicing of equipment and apparatus already in use; plans new installations, prepares specifications, and supervises the installations; and makes frequent inspections of buildings and equipment and recommends necessary changes and repairs. The additional clerk-draftsman requested is urgently needed in connection with the handling of departmental housing problems, fire protection, mechanical installations and laboratory facilities, the study of space requirements and assignments, the preparation and maintenance of adequate building plans, space charts, etc., including the compilation of data and preparation of reports.

In order to provide permanent office, laboratory and other accommodations for departmental activities for which no space will be available in the completed South Building, the Secretary of Agriculture has recommended to the Secretary of the Treasury that a new building be erected on the square immediately to the east of the present structure. The proposed building will be utilized to house offices and laboratories of the Weather Bureau, the Bureau of Public Roads, the Soil Conservation Service, the Office of Exhibits, and the Motor Transport Service repair shop and garage. Provision will also be made for housing in the proposed structure the mechanical shops of the Interior Department which serve the various bureaus of the Department of Agriculture. The additional clerk-draftsman herein requested will also assist in the study of space requirements and utilization, laboratory and mechanical installations, etc., in connection with the proposed new building.

(b) $1,620 for the employment of one additional nurse. The present staff of the emergency-room maintained in the South Building is wholly inadequate to properly care for all of the employees requiring emergency attention because of illness or injury. During the past six months the number of employees housed in the South Building has increased from 4,100 to approximately 5,200, and upon the completion during the fiscal year 1937 of the final sections of the new building (major portions of Wings 2 and 3, and the connecting headhouse on Independence Avenue between Wings 2 and 4) it is

expected that approximately 1,000 additional employees will be moved into the building. With the housing of additional personnel in the South Building there will result a corresponding increase in the demands upon the already inadequate emergency-room force, and the services of the nurse herein requested will be required to relieve the strain upon the present staff and to provide enlarged emergency-room facilities on a more satisfactory and efficient basis.

(c) $1,620 for a clerk for building directory service. Because of the immense size of the South Building and the large number of departmental activities and employees housed therein, it is essential for the convenience of the public that competent directory and information service be provided at the principal (14th Street) entrance to the building. This structure covers two long city blocks, extending from Independence Avenue to C Street and from 12th to 14th Streets. In its present state of completion the building provides approximately 851,000 square feet of office and laboratory space, and houses approximately 5,200 departmental employees. It is anticipated that during the latter part of the fiscal year 1937 the present uncompleted parts of the building (major portions of Wings 2 and 3 and the connecting Independence Avenue headhouse) will be ready for occupancy, making available for departmental use approximately 155,000 square feet of additional office and laboratory space and providing housing accommodations for approximately 1,000 additional employees. The services of the additional clerk will be utilized at the principal entrance to the building for the direction of visitors and others having business to transact or seeking information concerning the activities of the various branches of the Department.

CHANGE IN LANGUAGE

The insertion of the following new language is recommended:

> Provided further, That hereafter funds available for field work in the Department of Agriculture shall be available for employment by contract or otherwise of men with equipment, boats, work animals, animal-drawn and motor-propelled vehicles:

The new language is recommended in order to authorize the employment of men with teams, plows, scoops, or other equipment without the necessity of entering into formal contracts after advertising for bids.

The nature of the work done by several of the bureaus of the Department, especially the Soil Conservation Service, the Bureau of Biological Survey, and the Forest Service, is such that the employment of men with teams or other equipment, often for only a few days at a time, is essential to the efficient and economical prosecution of their activities. Many of the projects are located in isolated or sparsely settled communities where competition is difficult if not impossible to secure.

The insertion of this language in the Appropriation Act will permit these bureaus to employ men with teams and other equipment on a day-to-day basis and carry them on a payroll. It will eliminate much burdensome paper work

involved in executing contracts, permit the spreading of the work among the farmers and other local settlers of each community, and afford definite authority for a desirable practice not specifically authorized at present.

WORK DONE UNDER THIS APPROPRIATION

This appropriation provides salaries for employees of the Office of the Secretary of Agriculture, Undersecretary, Assistant Secretary, the Director of Extension Work (office force paid by Extension Service), the Director of Personnel, the Director of Budget and Finance, the personnel, classification, and investigations divisions, the budget, finance, and accounting divisions, the offices dealing with purchases, sales, and traffic, the division of operation, mail and files, telephone and telegraph, post office, emergency-room, housing, building directory and information services, labor force, etc. This organization comprises the administration of the scientific, extension, regulatory, personnel, financial, and business activities of the Department and serves in planning the organization of the work, the expenditure of funds, the contracting for the purchase of materials and equipment, the handling of mails and files, the operation of the telephone and telegraph services, and the procurement of space in Federal Buildings and the leasing of office, laboratory and storage quarters throughout the United States.

QUARTERS, HEAT, AND LIGHT ALLOWANCE AUTHORIZATIONS FOR 1937

No change is contemplated in the authorization of $33,400, contained in the appropriation item for "Salaries, Office of the Secretary", for payment during 1937, from the several bureau appropriations applicable, of allowances to officers and employees of the Department of Agriculture permanently stationed in foreign countries for living quarters, including heat, fuel, and light, as authorized by the Act approved June 26, 1930 (U.S.C., Supp. VII, title 5, section 118a).

The estimates of the three bureaus involved, on a per annum basis, for each of the fiscal years 1937 and 1936 are:

Agricultural Economics	$22,100
Entomology and Plant Quarantine	7,070
Animal Industry	1,400
Departmental reserve authority for contingencies	2,830
Total	33,400

A detailed schedule of the allowance rates for 1935 and 1936 and estimated for 1937 follows.

Schedule of Allowances for
Quarters, Heat, and Light of Employees
Permanently Stationed Abroad Under Act of
June 26, 1930

Appropriation and Subappropriation	Title of position	Post of duty	Classification of post	Domestic status	Group	Salary	Allowances Estimated 1937	Allowances Estimated 1936	Allowances Actual 1935
Bureau of Agricultural Economics									
Salaries and Expenses:									
Foreign Competition and Demand.....	Agri. Attache	Belgrade, Yugo.	II	M	2	$6,000	$ 1,300	$ 1,300	$ 1,300
	Agri. Attache	Berlin, Germany	V	M	2	6,000	1,700	1,700	1,500
	Asst.Agri.Attache	"	V	S	3	3,800	1,500	1,500	750
	Agri.Commissioner	"	V	M	2	5,600	1,600	1,600	1,400
	Sr. Mkt. Spec.	Bombay, India	IV	M	2	4,600,	1,500	1,500	---
	Agri. Attache	Buenos Aires, Arg.	V	M	2	6,000	1,700	1,700	1,500
	Agri. Attache	London, England	V	M	2	5,800	1,700	1,700	1,500
	Asst.Agr.Attache	"	V	M	3	4,600	1,500	1,500	---
	Prin.Mktg.Spec.	"	V	M	2	5,800	1,600	1,600	1,400
	Agri.Attache	Paris, France	V	M	2	5,600	1,700	1,700	1,500
	Asst.Agr.Attache	"	V	M	3	4,600	1,500	1,500	1,200
	Agr.Commissioner	Shanghai, China	V	M	2	5,800	1,700	1,700	1,500
	Asst.Agri.Comm.	"	V	M	3	3,800	1,500	1,500	1,200
	Asst.Agri.Comm.	"	V	M	3	4,600	1,500	1,500	---
	Commodity Spec.(Part)	"				---	---	---	250
	Reserve					---	100	100	---
Total, Bureau of Agricultural Economics.....						72,600	22,100	22,100	15,000

Appropriation and subappropriation	Title of position	Post of duty	Classification of post	Domestic status	Group	Salary	Allowances Estimated 1937	Allowances Estimated 1936	Allowances Actual 1935
Bureau of Entomology and Plant Quarantine									
Salaries and Expenses:									
Fruit Insects	Prin. Entomologist	Mexico City, Mex.	V	M	2	$5,800	$720	$720	$693
" "	Assoc. "	" " "	V	M	3	3,600	720	720	693
" "	Asst. "	" " "	V	S	3	2,900	500	500	463
" "	Asst. "	" " "	V	M	3	2,600	720	720	693
" "	Asst. "	Yokohama, Japan	IV	S	3	2,600	1,020	1,020	882
Cereal and Forage Insects	Entomologist	Hyeres, France	I	M	2	4,200	780	780	482
ditto	Asst.Entomologist	Hyeres, France	I	M	3	3,100	780	780	693
Forest Insects	Asst. Entomologist	Hyeres, France	I	M	3	3,100	720	720	617
" "	Assoc. "	Oxford, England	III	M	2	3,200	720	720	---
Cotton Insects	Asst. Entomologist	Tlahualilo, Mex.	I	M	3	2,800	450	450	400
Total, Bureau of Entomology and Plant Quarantine						33,900	7,070	7,070	5,616
Bureau of Animal Industry									
Salaries and Expenses:									
Inspection and Quarantine.	Sr. Veterinarian	London, England	V	M	2	4,600	1,400	1,400	1,400
Grand Total						111,100	30,570	30,570	22,016

(b) MISCELLANEOUS EXPENSES, DEPARTMENT OF AGRICULTURE

Appropriation Act, 1936.....$116,448 119,848
Budget Estimate, 1937..... 120,748
Increase..... 4,300

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)	Increase or decrease
Obligated:				
Miscellaneous Expenses, Department of Agriculture.....	$94,552	$103,248	$120,748	+ $17,500 (1)
Amounts transferred:				
To Division of Disbursement, Treasury Department.....	1,600	------	------	------
To Department of State.....	600	------	------	------
To "Salaries and Expenses, Office of the Solicitor"...	2,800	2,800	------	-2,800 (2)
From "Salaries, Office of the Secretary".....	-7,442	-6,200	------	+ 6,200 (3)
Total obligations.....	92,110	99,848	120,748	+ 20,900
Unobligated	23,514	(a)16,600	------	-16,600 (4)
Total appropriation.....	115,624	116,448	120,748	+ 4,300

(a) Includes $16,000 unobligated reserve for moving expenses and window blinds, South Building.

The increase of $4,300 for 1937 includes:

(1) An apparent increase of $17,500, but an actual increase of $1,500, as follows:

(a) An apparent increase of $16,000 for moving expenses and window blinds, in connection with the occupancy of additional portions of the new South Building. Due to the failure to complete the structure in accordance with the original schedule of construction, the $16,000 carried in the 1936 Act for moving and window blinds will remain unobligated during the fiscal year 1936. Upon completion of the final portions of the South Building during the fiscal year 1937, these funds will be required, as follows: $10,000 for moving the various offices and laboratories into quarters in the new portions of the building which it is expected will be completed during the latter part of 1937 (major portions of Wings 2 and 3, and the connecting headhouse on Independence Ave. between Wings 2 and 4), and $6,000 for equipping the new portions of the structure with window blinds.

(b) An actual increase of $1,500 for travel expenses of investigators in connection with investigations of fiscal, personnel, and other irregularities, and the periodical independent inspection of Department field stations for the purpose of discovering and preventing mismanagement, irregularities, and waste of public funds. Work of this character requires extensive travel to various parts of the country, and a minimum of $1,500 increase is needed for its successful prosecution.

(2) An apparent decrease of $2,800, due to the transfer of that amount to a new appropriation item for "Salaries and Expenses, Office of the Solicitor."

(3) An apparent increase of $6,200, due to the transfer from the appropriation for "Salaries, Office of the Secretary" of the amount representing the net cost to the Secretary's office of the salaries of the personnel engaged in reimbursable motor transport operations. The remainder of the salaries of this organization (approximately $18,800) is reimbursed to this appropriation from the funds of other bureaus for which motor trucking service is performed. This transfer is requested with a view to effecting the consolidation in the "Miscellaneous Expenses" appropriation of all reimbursable activities of the Office of the Secretary, and to facilitate and coordinate bookkeeping and accounting operations. Appropriate amendment to the language of this appropriation item, to provide for the payment of the motor transport salaries, is recommended under the paragraph dealing with "change in language."

(4) An apparent decrease of $16,600, but an actual decrease of $600, as follows:

(a) Apparent decrease of $16,000, due to the elimination in 1937 of an unobligated reserve for moving expenses and window blinds, as explained in note 1(a) above.

(b) An actual decrease of $600, representing the amount heretofore provided under this appropriation for the payment of the Department of Agriculture's proportionate share of the expense of the dispatch agent in New York City. The Secretary of State has notified the Secretary of Agriculture that beginning July 1, 1935, funds are available to the Department of State for this purpose and that no further transfer of funds will be requested of the Department of Agriculture.

CHANGE IN LANGUAGE

Several changes in the language of this item are recommended, as follows:

(1) The omission of the following language, relating to the payment of the Department of Agriculture's share of the expense of the dispatch agent in New York, is recommended:

> "for the payment of the Department of Agriculture's proportionate share of the expense of the dispatch agent in New York."

The State Department has indicated that no further transfers of funds will be requested from the Department of Agriculture for this purpose.

(2) In order to provide authorization for the payment under this appropriation of the salaries of personnel in the reimbursable Motor Transport Service, the insertion of the following new language is recommended:

> Provided, That this appropriation shall be available for the payment of salaries of employees engaged in the maintenance, repair, and operation of motor transport vehicles, and that this appropriation shall be reimbursed from the appropriation made for any bureau or office for which such service is performed, in accordance with the provisions of the Act of May 11, 1922 (42 Stat., 508):

(3) Changes are recommended as follows in the language covering operation of the Central Supply Section:

> Provided further, That the Secretary of Agriculture, during the fiscal year [1936] 1937, may maintain stocks of stationery, supplies, equipment, and miscellaneous materials sufficient to meet, in whole or in part, requirements of the bureaus and offices of the Department in the city of Washington and elsewhere, but not to exceed in the aggregate, $200,000 in value at the close of the fiscal year, and the appropriations [made for] of such bureaus [and], offices , and agencies available for [such stocks] the purchase of stationery, supplies, equipment, and miscellaneous materials shall be available to reimburse the appropriation for miscellaneous expenses current at the time supplies are allotted, assigned, or issued or when payment is received; for transfer for the purchase of inventory; and for transfer pursuant to the provisions of Section 601 of the Act approved June 30, 1932 (47 Stat., pp. 417, 418): Provided further, That the appropriations made hereunder shall be available for the payment of salaries [of employees engaged] and expenses [in] for purchasing, storing, handling, packing, or shipping [of] supplies and blank forms, and [the amount of such salaries] there shall be charged proportionately as a part of the cost of supplies issued an amount to cover such salaries and expenses, and in the case of blank forms and supplies not purchased from this appropriation [the] an amount [of] to cover such salaries and expenses shall be charged proportionately to the proper appropriation: Provided further, That the facilities of the central storehouse of the Department shall to the fullest extent practicable be used to make unnecessary the maintenance of separate bureau storehouse activities in the Department: Provided further, That a separate schedule of expenditures, transfers of funds, or other transactions hereunder shall be included in the annual Budget.

These changes are requested in order to solve, if possible, without an additional appropriation for the purpose, the problem which has arisen out of the inadequacy of the present Central Stores inventory to meet the

tremendously increased demands for supplies, due principally to the establishment in the Department of the Agricultural Adjustment Administration and the Soil Conservation Service. During 1935 the total value of stores issued by the Central Supply Section was $577,013.26, of which the Agricultural Adjustment Administration required $230,353.86. In March, 1935, the Soil Conservation Service was transferred to the Department and immediately became one of the largest participants in the centralized service, having drawn stores amounting to $51,396.25 during the four months ended August 31, 1935, a monthly average of $12,849. The turnover in the present stock is approximately six times annually.

The Central Supply Section was established without any direct appropriation, its capital consisting almost entirely of inventory contributed by the various bureaus and offices whose supply rooms were from time to time consolidated with it and of small sums expended from the appropriation for "Miscellaneous Expenses, Department of Agriculture." Since the Agricultural Adjustment Administration and Soil Conservation Service were only recently created they did not make a contribution to the central stock, but their participation therein resulted in an increase of 273% in its volume of business with no increase in its resources. This has impaired the supply service to these agencies and to the entire Department and creates a critical situation toward the end of each fiscal year when there are no funds available for placement of orders for maintaining an adequate general stock inasmuch as the reimbursement of the appropriation "Miscellaneous Expenses" is dependent upon repayment from the various bureaus and offices.

The outstanding deficiency is the inability of the Department, due to lack of funds and inability to effect reimbursements quickly enough for the purpose, to maintain a large enough stock of general stores in the Supply Section. The principal change proposed in the language is to give the Secretary authority "<u>to transfer for the purchase of inventory</u>." Under this language funds of the several agencies in the Department, available for the purchase of supplies, such as the Agricultural Adjustment Administration and the Soil Conservation Service, could be transferred by the Secretary directly into the appropriation for "Miscellaneous Expenses" for the purchase of sufficient stores to bring the stocks of the Central Supply Section up to a level adequate to meet the increased demand for supplies, caused so largely by these organizations, thus placing them in the same relationship with respect to contribution to the general stores inventory as other bureaus whose stocks were taken over originally or subsequently merged with the Central Stores inventories. This authorization would also enable the Department to augment the inventory, within the $200,000 limitation set by the law, from funds of other bureaus, at such times as the situation demanded such action and as funds were available therefor. Unless such authorization can be given it will be absolutely necessary to provide a direct increase of appropriation for the purchase of inventory.

The language in the Appropriation Act for the present fiscal year provides only for reimbursement of the appropriation "Miscellaneous Expenses" <u>current</u> at the time stores are <u>issued</u>. Due to fiscal year limitation, if the supply section can be brought up to a proper inventory basis this might force purchases in June, in order to prevent depletion of the inventory, which could be made more advantageously in July or August. A second change

in language is requested, therefore, to provide for reimbursement of the appropriation "Miscellaneous Expenses" either current at the time stores are issued, which is the present case, or current "when payment is received." Thus reimbursement on July 15 for supplies issued on June 28 could go into the appropriation at that time current, if needed for replenishing purposes, and if not required to balance the "Miscellaneous Expenses" appropriation of the preceding year.

A third change in language authorizing reimbursement at the time supplies are "allotted" or "assigned" is for the purpose of making it entirely clear that reimbursement may be had prior to actual issuance for supplies ordered and paid for from "Miscellaneous Expenses" but which are of such special character or so marked or labeled that they can be used by or issued only to the bureau to be charged. In such cases these supplies are not a part of the general inventory and the Central Stores Section is acting merely as a custodian of stocks that might as well be stored in the bureau concerned insofar as their storage in the central section adds to the general resources thereof for departmental supply purposes.

Other changes in the language of this section are minor and of a perfecting character.

WORK DONE UNDER THIS APPROPRIATION

This appropriation, as indicated by its terms, provides for a great variety of miscellaneous objects necessary in the conduct of the work of the Department, including stationery, furniture, and office equipment and supplies, lumber, hardware, glass, paint, laundry, telegraphing and telephoning, ice, postage, travel expenses, maintenance and operation of motor vehicles, freight, express and drayage charges, and miscellaneous supplies and expenses not otherwise provided for and necessary for the practical and efficient work of the Department. It provides, also, for the compensation of the personnel of the Motor Transport Service and of such personnel of the Central Supply Section as may be engaged in the procurement, storage, issue, and shipment of supplies and materials for the several bureaus of the Department, reimbursement being made to this appropriation from the funds of the bureaus for which service is rendered.

(c) RENT OF BUILDINGS IN THE DISTRICT OF COLUMBIA

Appropriation Act, 1936.....$63,000
Budget Estimate, 1937..... 63,000

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Rent of buildings in the District of Columbia.....	$61,796	$63,000	$63,000
Unobligated:			
Savings.....	1,204	---	---
Total appropriation.....	63,000	63,000	63,000

No change is recommended in this item for the fiscal year 1937. Due to delays in the building program, more than a year will elapse before the completion of the new South Building. Construction is just now about to start on the final portions of the building (major parts of Wings 2 and 3 and the connecting headhouse on Independence Avenue between Wings 2 and 4). The housing plans of the Department were completely disrupted by the necessity of providing approximately one-sixth of the new agricultural building for occupancy by the Agricultural Adjustment Administration, the space utilized for this purpose having been originally designed for the use of other branches of the Department. It will not be possible, therefore, for the Department to effect any material reduction in the space occupied in leased structures during the fiscal year 1937.

WORK DONE UNDER THIS APPROPRIATION

This appropriation provides funds for the rental of office, laboratory, and storage space for the several bureaus, offices, and units of the Department in the District of Columbia for which no quarters are available in Government-owned structures.

In the following statement are shown the buildings under rental during the fiscal year 1935, and the estimated rentals for the fiscal years 1936 and 1937:

Building	Bureau Occupying Space	F.Y. 1935	F. Y. 1936	F. Y. 1937
Atlantic Bldg...	Forest Service.....	$30,000	$30,000	$30,000
Willard Bldg....	Public Roads.....	15,000	15,000	15,000
McKinley Bldg...	Chemistry and Soils..	13,500	12,800	12,800
2513 M St. N.W..	Weather.....	1,000	1,000	1,000
1004 Eye St. N.W.	Forest Service.....	1,000	1,000	1,000
920 F St., N.W..	Forest Service.....	600	600	600
918 F St. N.W..	Forest Service.....	696	58	-----
Amount available for emergency rentals and reconditioning of rented quarters upon relinquishment.....		1,204	2,542	2,600
Total.....		63,000	63,000	63,000

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated 1935	Estimated Obligations 1936	Estimated Available for 1937
Agricultural Adjustment Administration (Salaries and Expenses):			
Transferred to Office of the Secretary for administrative accounting, auditing, and miscellaneous services and expenses in connection with the agricultural adjustment programs.....	(a) $228,854	x $457,770	x $457,770
Public Works Allotment (National Industrial Recovery Act):			
Installation of sewage treatment and disposal system at the Beltsville (Md.) Research Center.....	142,700	4,300	------
Total, Emergency Funds.....	371,554	462,070	457,770

(a) Covers part of year only in some cases.

x Total allotment $480,250. ($22,480 recommit)

OFFICE OF THE SOLICITOR

(a) SALARIES AND EXPENSES

Appropriation Act, 1936:	
Allotment from: "Salaries, Office of the Secretary"	$178,401
"Miscellaneous Expenses"	2,800
Total available, 1936	181,201
Budget estimate, 1937	188,801
Increase	7,600

The estimates for the Office of the Solicitor, heretofore included under the appropriation for "Salaries and Expenses" of the Office of the Secretary, are submitted as a separate item for 1937. The legal work incident to the administration of the Agricultural Adjustment Act is now conducted by the Solicitor's Office, under an allotment of A.A.A. funds, and with these added functions the present size of the office as a whole and the administrative details involved in its operation are such that it can be operated more effectively and its duties and functions more clearly presented if it is financed as a separate appropriation unit of the Office of the Secretary.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
Legal advice and assistance	$ 172,510	$ 181,201	$188,801	$ 7,600 (1)
Unobligated:				
Savings	1,216	- - -	- - -	- - -
Total appropriation	(a) 173,726	(a) 181,201	188,801	7,600 (1)

(a) Allotments from Office of the Secretary.

(1) The increase of $7,600 is apparent only and covers the transfer of two attorneys at $3,800 per annum each, one now being paid from the appropriation "Perishable Agricultural Commodities Act", Bureau of Agricultural Economics, and the other from the appropriation "Enforcement of the Food and Drug Acts", Food and Drug Administration, and corresponding decreases are being made in the 1937 estimates for these two bureaus to offset this amount.

WORK DONE UNDER THIS APPROPRIATION

The Office of the Solicitor has charge of the legal work of the Department. This appropriation provides for salaries and expenses of the office, including the division of national forests, grain futures, cotton futures, grain standards, cotton standards, Federal warehouse, excess wool profits, farm products inspection, produce agency, standard container, packers and stockyards, and perishable agricultural commodities; the division of food and drugs, insecticides and fungicides, Federal seed, tea inspection, naval stores, virus-serum control, meat inspection, Federal import milk, Federal caustic poison, and compilation of laws; the division of animal and plant quarantine, Federal-aid roads, 28 hour law, bee imports, and agricultural colleges and experiment stations; the division of wild-life conservation, claims, fiscal, personnel, leases, contracts, and patents; the division of business administration, including the stenographic and the mail and files section; the regional law officers in the field.

In addition, there are divisions handling the work under the Agricultural Adjustment Act and the work of land acquisition, financed by allotments from the funds available for these purposes.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated available, 1937
Agricultural Adjustment Administration (Salaries and Expenses):			
Transferred to Office of the Solicitor for legal work relating to the Agricultural Adjustment Administration programs.....	$ 143,868*	$ 485,010	$ 485,010
*Financing for 3 months - April 1 to June 30.			
National Industrial Recovery, Agriculture, ~~Public Works Allotment (National Industrial Recovery Act)~~: Wildlife Refuges			
For legal services in connection with the acquisition of land for wildlife refuges	-----	60,000	-----
Emergency Relief Appropriation Act of 1935:			
For legal services in connection with land-acquisition projects (forest and wildlife)	335,000	65,000	-----
For legal expenses in connection with the title examination, etc., related to acquisition of lands by the Forest Service.....	-----	483,500	-----
Total, Emergency Relief	335,000	548,500	-----
Total, Emergency Funds (Direct Allotments).....	478,868	1,093,510	485,010

OFFICE OF INFORMATION

(a) SALARIES AND EXPENSES

Appropriation Act, 1936	$363,282
Budget Estimate, 1937	363,282

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
1. General administration of Office of Information and of informational work of the Department	$15,819	$16,795	$16,795
2. Business service, including mail and files	24,423	26,660	26,660
3. Publications preparation and control:			
Editorial control and final preparation of manuscripts	26,899	29,175	29,175
Preparation of Yearbook and special reports	8,616	9,595	9,595
Indexing Department publications	8,861	9,475	9,475
Preparation of illustrations for publications.....	19,038	19,270	19,270
Photographic service for the Department.....	30,114	31,920	31,920
Printing procurement.....	14,951	15,055	15,055
Total, Publications preparation and control.....	108,479	114,490	114,490
4. Distribution of agricultural information directly to the Public:			
Control of mailing lists for distribution work.....	9,219	9,420	9,420
Handling Congressional and general-public requests for agricultural information.....	46,606	51,020	51,020
Total, Distribution of agricultural information directly to the public.....	55,825	60,440	60,440
5. Preparation and distribution of agricultural information to the press.....	30,015	30,765	30,765

Projects	1935	1936 (Estimated)	1937 (Estimated)
6. Preparation and distribution of agricultural information by radio.....	$ 28,241	$ 28,940	$ 28,940
7. Addressing, duplicating, and Mailing service for the Department..	80,781	85,192	85,192
Total obligations.....	343,583	363,282	363,282
Unobligated:			
Legislative impoundments.....	700	--	--
Other amounts unobligated.....	324	--	--
Total appropriation.....	344,607	363,282	363,282

WORK DONE UNDER THIS APPROPRIATION

The work under this appropriation consists of bringing together, preparing, interpreting, and disseminating useful information developed by the economic, adjustment, research, service, conservation, regulatory, and many special programs of the Department. Essentially, problems are solved by specialists who are located in different bureaus. Before information can be useful to the farmer, it must be brought together from different specialists and interpreted along commodity lines. This educational work is carried forward through numerous radio stations, in cooperation with the press, and by issuing technical and popular publications. The Office of Information handles all problems affecting the informational activities of the Department, including the editorial, illustrating, printing, and distribution phases, and supervises the informational activities of the 20 bureaus and offices of the Department; cooperates with more than 300 radio stations daily, which donate to the Department 35,000 hours of time annually; prepares annually 3,000 separate manuscript radio programs and approximately 1,450 press releases; edits about 1,400 technical and popular manuscripts; cooperates with all agricultural colleges and experiment stations in maintaining an effective national policy for agricultural information; coordinates information of the Department with that of the Farm Credit Administration and other governmental agencies. In the present emergency, greatest emphasis is placed on programs designed to increase the buying power of farm commodities and on important changes in practices which farmers themselves should make.

Project 1: General administration of Office of Information and of informational work of Department.--This office correlates the informational work of the bureaus of the Department with that of the Agricultural Adjustment Administration, other Federal agencies, and the land-grant colleges and extension services; establishes and controls information policies; governs what types of information are to be disseminated to be of greatest assistance to farmers and others; and supervises generally the bringing together on a commodity basis the knowledge developed by specialists in the several bureaus.

Project 2: Business service, including mails and files.--The financial, business, purchasing, personnel, and legal affairs of the Office of Information are handled by this division. The central file section handles an average of 200,000 letters each month, vises all outgoing mail, and maintains subject-matter files and library for the Office of Information.

Project 3: Publications preparation and control.--If all significant material developed in the Department were published each year, there would be issued approximately 3,000 new circulars, technical bulletins, statistical bulletins, Farmers' Bulletins, and so on. This is not possible under available funds. The Office of Information must decide what material is to be published, in what form, and in what quantity. After selecting and arranging for the preparation of the most urgent material, the office publishes an average of 1,400 highly technical manuscripts covering basic economic and scientific research, and popular manuscripts carrying practical advice to farmers and others. It handles the editing, indexing, illustrating, and printing work involved. It prepares the Yearbook of Agriculture and the Secretary's annual report to the President and Congress.

Project 4: Distribution of agricultural information directly to the public.--Publications comprise the most effective and cheapest means of getting agricultural science into practice and of placing economic information for emergency and long-time use into the hands of farmers and others. The Office of Information distributes publications in two ways: (a) A very small group of cooperating scientists, libraries, and county agents receive selected bulletins direct through the use of highly classified mailing lists which are maintained and kept up to date in the Office; (b) bulletins are mailed in response to specific requests, including requests cleared through Members of Congress. These requests seek information on every phase of agriculture, and the Office of Information selects those publications that will supply the required information. When incoming requests can be so handled, the total cost to the Government is about 1-1/2 cents each; but if bulletins are not available and a special letter must be prepared, the cost is about 30 cents each. The Department now has about 14,000 bulletins to select from in furnishing the information desired, but under the limitations of the printing fund only a small percentage of these are maintained on the free list. The Department furnishes to the public about 40 percent of the bulletins specifically requested.

Project 5: Preparation and distribution of agricultural information to the press.--Practical information about the Department's regular and emergency activities is disseminated by issuing releases direct to the press, including farm papers, trade and technical journals, daily and weekly newspapers, press associations, special writers, and correspondents. Special articles on farming, gardening, household matters, and science are prepared for newspaper syndicates and for individual publications. Mailing lists are highly classified so that material is sent only to those publications likely to use it. The demands from the press for information have increased greatly because of the wide interest in the most fundamental type of information on such subjects as land planning, enlarged conservation programs, shift to grass agriculture, subsistence

farming, and scientific work in general.

Project 6: Preparation and distribution of agricultural information by radio.--All of the radio programs of the Department are prepared by this office. The total amounts to more than 3,000 separate programs annually. At present the Department handles each day two network programs, originating in Washington, D. C., and San Francisco, Calif., and reaching most of the States through 60 stations associated with the National Broadcasting Company; and syndicate programs to about 300 individual stations. The Radio Service also supervises a weekly broadcast (Friday afternoons) over a network of 25 stations serving listeners in some 20 States with consumer information. The syndicate programs are now issued in cooperation with 37 of the State extension services, so as to localize the material. In some States the programs are being further localized and delivered by county agents. Thus localized, surveys show, these programs have become one of the most valuable sources of information for farmers. While radio is effective for disseminating all classes of agricultural information, it is indispensable for the rapid distribution of economic material. All radio time is donated by the stations.

Project 7: Addressing, duplicating, and mailing service for the Department.--For purposes of economy and efficiency, the Department maintains a centralized service unit for addressing, duplicating, and mailing work. Duplication by mimeograph and multigraph is essential for the rapid distribution of administrative orders, market reports, adjustment information, radio and press releases, progress reports, and other material too ephemeral in nature to justify printing. This service is supplemented to some extent by the various bureaus.

(b) PRINTING AND BINDING

Appropriation Act, 1936.....	$800,000
Budget Estimate, 1937.....	850,000
Increase.....	50,000

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
1. Job work and binding, expenditures for printing:				
1-a. Binding.....	$ 25,340	$ 27,000	$ 27,000	--
1-b. Emergency field printing.	1,987	6,000	6,000	--
1-c. Job work	204,468	246,000	246,000	--
1-d. Letterheads.....	12,492	7,600	7,600	--
Total, Job work and binding, expenditures for printing...	244,287	286,600	286,600	--

Projects (cont.)	1935	1936 (Estimated)	1937 (Estimated)	Increase
2. Reports, periodicals, and other regulatory, service, and administrative publications, expenditures for printing:				
2-a. Agricultural situation.....	3,392	3,500	3,500	--
2-b. Annual reports.....	10,800	9,500	9,500	--
2-c. Climatological data.....	17,850	20,300	20,300	--
2-d. Congressional documents.....	1,680	2,400	2,400	--
2-e. Crops and Markets.....	28,950	31,000	31,000	--
2-f. Experiment Station Record ..	16,432	17,500	17,500	--
2-g. Extension Service Review....	5,930	6,000	6,000	--
2-h. Farmers' Bulletin lists.....	2,778	3,050	3,050	--
2-i. Forest folders.....	6,032	6,000	6,000	--
2-j. Indexes.....	595	4,500	4,500	--
2-k. Inventory of Seeds and Plants Imported.....	660	2,100	2,100	--
2-l. Journal of Agricultural Research.....	5,690	5,850	5,850	--
2-m. Monthly List of Publications.....	806	900	900	--
2-n. Monthly Weather Review.....	9,322	9,500	9,500	--
2-o. Monthly Weather Review Separates	813	1,300	1,300	--
2-p. Service and Regulatory Announcements.....	21,679	21,400	21,400	--
2-q. Unnumbered publications....	25,071	17,300	17,300	--
2-r. Yearbook of Agriculture.....	17,300	18,000	18,000	--
Total, Reports, periodicals, and other regulatory, service, and administrative publications, expenditures for printing.....	175,780	180,100	180,100	--
3. Research and technical bulletins, expenditures for printing:				
3-a. Circulars.....	11,075	13,000	15,000	+ 2,000 (1-a)
3-b. Experiment station bulletins and reports.....	960	1,300	1,300	--
3-c. Journal of Agricultural Research separates.....	15,346	16,700	18,850	+ 2,150 (1-c)
3-d. North American Fauna.....	990	900	900	--
3-e. Reprints and revisions of former series.....	1,200	1,200	1,200	--
3-f. Soil surveys.....	59,000	64,100	98,750	+34,650 (1-f)
3-g. Statistical bulletins.....	1,565	5,800	8,000	+ 2,200 (1-g)
3-h. Technical bulletins.....	35,360	37,000	46,000	+ 9,000 (1-h)
Total, Research and technical bulletins, expenditures for printing.....	125,496	140,000	190,000	+50,000 (1)

Projects (cont.)	1935	1936 (Estimated)	1937 (Estimated)	Increase
4. Farmers' Bulletins and other popular publications, expenditures for printing:				
4-a. Clip sheet.....	$ 3,037	$ 3,100	$ 3,100	--
4-b. Farmers' Bulletins - new.....	14,100	18,000	18,000	--
4-c. Farmers' Bulletins - reprints and revisions.....	76,722	128,500	128,500	--
4-d. Leaflets - new	1,177	1,800	1,800	--
4-e. Leaflets - reprints and revisions.....	3,235	7,400	7,400	--
4-f. Miscellaneous publications...	26,288	31,000	31,000	--
4-g. Posters.....	150	2,500	2,500	--
4-h. Yearbook separates.....	940	1,000	1,000	--
Total, Farmers' Bulletins and other popular publications, expenditures for printing.....	125,649	193,300	193,300	--
Transferred to Treasury Department....	300	--	--	--
Total appropriation.....	(a) 671,512	800,000	850,000	+50,000(1)

(a) Includes $61,046 authorized by Sec. 23, Act of March 28, 1934, to cover increased cost of printing due to 40-hour week provision.

(1) The $50,000 increase for 1937 is requested exclusively for technical publications, especially soil surveys. Many technical manuscripts, reporting the results of economic and scientific research, are being held up. This accumulation of basic material, representing the real purpose of the public's investment in the Department of Agriculture, will eventually have to be printed. Much of it is of the utmost importance now in connection with the land utilization, back-to-grass, conservation, and other emergency programs. Soil surveys, for example, are being used in land planning. About 50 surveys will be completed this year, but only 35 of these can be printed with present funds.

The 1936 appropriation was slightly more than $125,000 greater than the expenditures for 1935; but of the increase between 1935 and 1936 a large share was to meet the increased cost of printing, which averaged about 22 percent. A small increase was for popular publications.

Specifically, the $50,000 increase recommended for 1937 is for the following classes of technical publications:

$2,000 for circular series: The circular series is used for semitechnical reports on the results of scientific research. The annual cost has averaged about $25,000 a year. Today research manuscripts are being put on the shelf. Some are being published outside, in which case the Department loses a good share of their value. Last year one bureau placed 288 brief reports with outside journals. Even so, the bureau had to hold in abeyance more than 22 extremely important manuscripts of varying lengths

which could not be published either by the Department or by outside agencies. In another bureau, Entomology and Plant Quarantine, practically all manuscripts resulting from studies on the life histories of various insect species are being filed, even though they are essential to all entomologists who are working on control methods and eradication.

$2,150 for Journal of Agricultural Research separates: At present the Department is refusing to supply more than 250 copies of each separate from the Journal. These restrictions are undesirable. The Department's scientists receive assistance from scientists in all parts of the world, and it has always been the practice for these specialists to exchange reports on their basic research. This is mutually advantageous to all research institutions.

$34,650 for soil surveys: At present the Department is four years behind in publishing soil surveys. At the same time, the soil surveys are in greater demand now than in any previous period. This is because of the fundamental land planning under way by the States, Tennessee Valley Authority, Agricultural Adjustment Administration, Forest Service, Soil Conservation Service, Bureau of Agricultural Economics, and other agencies. The Bureau of Chemistry and Soils is now producing 50 soil surveys each year, and is estimating an increase. The cost of publishing complete surveys ranges from $1,200 to $4,600 each, or an average of about $1,875. This would make a minimum cost of $93,750 for 50 surveys, whereas the maximum allocation the Department can make for publishing soil surveys from present funds is $64,100.

$2,200 for statistical bulletins: Statistical material of the Department, other than that included in the Yearbook, Crops and Markets, and the Agricultural Situation, has averaged $8,000 a year for printing for many years. In 1933 and 1934, and to a much greater extent in 1935 when expenditures were cut down to $1,565, a serious arrearage has developed. The growing interest of farmers and the general public in statistical and other economic data is, naturally, causing a greater demand for this material, which is gathered at considerable expense by the Department. Furthermore, for greatest value, such statistical material should be printed promptly.

$9,000 for technical bulletins: The Department has been postponing the printing of some of its most fundamental research results. Life studies of insects have already been mentioned. Such fundamental research results as those on rotenone and on the effect of light in promoting rancidity have never been recorded in detail in Department bulletins. These publications should be the culmination of research itself. Yet throughout the scientific staff of the Department there is a growing discouragement at the failure to have valuable results see the light of day. It is bad economy to jeopardize far-flung and costly fundamental work because of our inability to pay a small percentage of such total cost for printing.

WORK UNDER THIS APPROPRIATION

The work under this appropriation consists of publishing the results of the scientific research, economic, service, regulatory, and conservation work of the Department. Necessary administrative forms, letterheads, certificates, etc., are printed. The various types of printed material may be grouped roughly into four classifications: (1) Administrative job work and binding; (2) administrative

reports, periodicals, and publications; (3) research and technical publications; and (4) popular publications. The first two groups are used primarily to aid proper administration within the Department itself. Publications falling within the last two classifications are used to spread economic, scientific, and other practical knowledge to farmers, scientists, economists, processors, and the general public.

Project 1: Job work and binding, expenditures for printing--

(a - Binding).--Most of the binding work in the Department is done for the central library, the Weather Bureau library, and the Office of Experiment Stations library. There is now an accumulation of more than 40,000 unbound periodicals, serials, reports, and proceedings. It is imperative to keep this material reasonably current if the Library is to give service because current material is in greatest demand.

(b - Emergency field printing).--Inspection tags, certificates, forms for agricultural representatives abroad, fire protection signs, etc., are often needed quickly and consequently cannot be printed in Washington, D. C. This item covers these emergency needs.

(c and d - Job work and letterheads).--Crop reporting forms, schedules, administrative forms, certificates, etc., are indispensable simply to carry on the regular activities of the Department. Job printing needs are increasing. The Bureau of Agricultural Economics, for example, because of more frequent price and other reporting, now requires about $65,000 for job work, as compared to $50,000 previously.

Project 2: Reports, periodicals, and other regulatory, service, and administrative publications--

(a - Agricultural Situation).--This periodical, sent monthly to a small group of cooperating economists, technologists, and extension agents, is used to keep key groups in agriculture currently informed of the economic situation, including statistics relating to production, movement, consumption, prices, and purchasing power.

(b - Annual reports).--These reports briefly make a permanent record of the work performed during the preceding fiscal year. Most are required by law. In recent years they have been held to about 60 percent of their former size.

(c - Climatological data).--In addition to the regular issuance of Climatological data, Bulletin W (Summaries of Climatological Data) is being published. It comprises 106 separates covering the United States, Alaska, and Hawaii.

(d - Congressional documents).--The Department pays for bills, resolutions, reports, Congressional directories, Congressional Records, etc., as Congressional Documents.

(e - Crops and Markets).--This periodical contains statistics and information on crops and livestock estimates (the printing of many of which is mandatory), market information, reports on supplies, stocks, commercial movements, etc. Crops and Markets is sent to 120,000

voluntary crop reporters, who receive no other payment for their services, and who use the periodical as a basis for future reports to the Department.

(f - Experiment Station Record).--This journal abstracts the world's economic and scientific literature on agriculture, with particular reference to the research reports from the State experiment stations. This periodical is the cheapest and most effective means of keeping all research workers informed of current scientific developments, and it effectively promotes the coordination of research itself.

(g - Extension Service Review).--This periodical, distributed monthly throughout the agricultural extension organization, contains current extension material regarding extension practices, accounts of decisions and actions of the Agricultural Adjustment Administration, and reviews of new extension developments in the various State institutions. It is especially important now because extension officials are field officers for the Department, the Agricultural Adjustment Administration, the Resettlement Administration, and other agencies.

(h - Farmers' Bulletin lists).--Farmers' Bulletins are mailed only upon request. Consequently, lists showing the available publications must be furnished to Congressmen, extension agents, and farmers.

(i - Forest folders).--More than 31 million persons visit the national forests each year. These folders are used to induce visitors to use the forests properly, thus reducing the fire hazard. They are now being used by members of the Civilian Conservation Corps to acquaint themselves with forestry purposes and practices.

(j - Indexes).--As Department publications increase in number and scope, indexes become increasingly important. Practically all indexes, including the Index of Animal Parasites - the only one of its kind in the world - were held up during 1935. A few of the most urgently needed indexes are now being printed.

(k - Inventory of seeds and plants imported).--These inventories contain a record of the new and little known seeds and plants procured mostly from abroad for the use of the Department, State experiment stations, and experimenters in appropriate locations throughout the United States.

(l - Journal of Agricultural Research).--This publication carries the most technical reports of pure research performed in the Department and the State experiment stations. Distribution is rigidly limited to selected libraries.

(m - Monthly List of Publications).--For economy the Department does not list those who request to receive all printed publications. The list of new publications is mailed instead. Scientists, economists, foreign and domestic libraries, and teachers make up the bulk of the mailing list.

(n and o - Monthly Weather Review and separates).--This periodical contains reports of research by the staff of the Weather Bureau, records of weather observations in the United States, with climatological charts. It also deals with floods, storms, earthquakes, solar radiation, etc. It is distributed to Weather Bureau field stations, Signal Corps, meteorological and naval air stations, and libraries. The separates, each covering a single subject or group of statistics, are distributed separately, for purposes of economy. This is the only meteorological publication of its kind in the United States. It is the textbook for weather officials. It is exchanged with foreign weather bureaus. The general public, of course, can obtain copies only by purchase.

(p - Service and Regulatory Announcements).--Bureau of Animal Industry orders, notices of judgment, notices of quarantine, etc., are mandatory and are essential in carrying forward the regulatory programs.

(q - Unnumbered publications).--This series is used for such bulletins as "Economic Trends Affecting Agriculture," "Forest Area Tables," "Daily River Stages," "Report on Highway Transportation," "The Taxation of Motor Vehicles," Bureau directories, Instructions of Airway Meteorological Service, Weather Forecasting, etc.

(r - Yearbook of Agriculture).--This annual publication, required by law, is for all groups interested in the new developments of agriculture. The bulk of the Department's distribution is to its own collaborators, and most of the Congressional distribution (paid for from Congressional funds) is to farmers. It is an extremely useful, up-to-date publication that interprets almost every phase of the farm industry.

Project 3: Research and technical bulletins--

(a - Circulars).--The circular reports in semitechnical form results of the manifold research programs of the Department. The annual cost of circulars has in the past ranged from $20,000 to $30,000. The circulars are among a group of several classes of publications that can be postponed, if money is not available, but to do so defeats the very purpose for which the Department exists.

(b - Experiment Station bulletins and reports).--This series is used to report the results of research done at the insular experiment stations. It also includes the annual report of the insular stations.

(c - Journal of Agricultural Research separates).--The bound copies of the Journal itself are sent to a very restricted mailing list. Only libraries and foreign institutions on an exchange list receive it free of charge. Separates are sent to scientists who request technical information on the specific subject covered.

(d - Reprints and revisions of former series).--A number of series such as Department Bulletins, Department Circulars, and Miscellaneous Circulars have been superseded by other series. However, much

scientific information contained in the older publications is necessary in carrying on current work and can be reprinted for less than it would cost to print new manuscripts.

(e - Soil surveys).--The soil survey publications are mandatory by law. In 1930 the Department paid approximately $75,000 for soil surveys. In 1931 the expenditure was $97,000. In 1932 and 1933 the normal expenditures would have been approximately $100,000 each year, but to affect economies the Department spent only slightly more than $50,000 each year. The expenditure of $46,356 in 1934, $59,000 in 1935, and $64,100 in 1936 will cause the Department to become still more in arrears in printing these surveys.

(f - Statistical bulletins).--Statistics of grain, statistics of futures trading, and similar statistics - the printing of many of which is mandatory - are contained in this series.

(g - Technical bulletins).--This is one of the most important series of publications issued by the Department. They form a permanent record of research results for Department scientists, cooperating institutions, and scientists of the experiment stations. At present the Department faces the condition of achieving valuable research results without possessing the opportunity to give these results to the public in a usable form. Every effort has been made to reduce the length of each manuscript and the number of copies printed of each technical bulletin. But if a research report is to be valuable it must be complete. Consequently, the only alternative is to complete the preparation and editing of the technical manuscripts and then to hold them until funds for their printing are available. The cost of printing is such a small percentage of the total investment the Government has put into research itself that there is no economy in failing to give the taxpayers the results for which they have paid.

Project 4: Farmers' Bulletins and Other Popular Publications--
(a - Clip Sheet).--The Clip Sheet, sent weekly to 4,000 newspapers, contains brief suggestions on improved farm practices, economic adjustments, and accounts of Department activities.

(b,c,d, and e - Farmers' Bulletins and leaflets - new and reprints)--Farmers' Bulletins contain practical information for farmers. They constitute one of the most effective means of putting science into practice. Four-fifths of all Farmers' Bulletins are distributed by Members of Congress. The Department and most Members of Congress mail publications only upon specific request. The leaflets are merely 4-and 8-page Farmers' Bulletins. These bulletins cost, including printing and mailing charges combined, only about 1-1/2 cents a copy. If they did no more than enable the Department expeditiously and efficiently to answer correspondence, they would be worth far more than they cost.

(f - Miscellaneous Publications)--Such publications as the Dairy Graders' Handbook, List of Technical Workers, List of

Available Publications, "Protect White Pine from Blister Rust," "Revised Federal Grain Standards", the Agricultural Outlook (annual), etc., are included in this series. The material is largely non-technical and the distribution in all cases is specialized.

(g - Posters).--Special campaigns such as bovine tuberculosis eradication, Bang's disease control, avian tuberculosis eradication, and fire protection require posters to induce large numbers of people to better inform themselves of their problems and to cooperate in their solution.

(h - Yearbook separates).--The Yearbook itself contains some 250 brief articles on as many subjects. Some of these are printed in very small volume as separates to use in answering correspondence.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated 1935	Estimated obligations 1936	Estimated available, 1937
Agricultural Adjustment Administration (Salaries and Expenses):			
Transfer to Office of Information for assistance in handling the increased printing, press, radio, and mailing-list work caused by the agricultural adjustment programs.....	$ 2,454	$ 15,320	$ 15,320

LIBRARY

SALARIES AND EXPENSES

Appropriation Act, 1936	$ 99,812
Budget Estimate, 1937	103,800
Increase	$ 3,988

PROJECT ESTIMATE

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
General administration and business service	$ 14,083	$ 17,430	$ 17,430	------
Acquisition of publications by purchase, gift and exchange, and preparation of material for binding	42,380	44,272	48,260	$+3,988(1)
Classifying, cataloguing and indexing of publications	18,697	20,495	20,495	------
Circulation, reference and bibliographical service	16,527	17,615	17,615	------
Total obligations	91,687	99,812	103,800	+3,988
Unobligated:				
Legislative impoundments	500	------	------	------
Total appropriation	92,187	99,812	103,800	+3,988

(1) An increase of $3,988 in the project "Acquisition of publications by purchase, gift and exchange, and preparation of material for binding." The need for additional funds for the purchase of books and periodicals is urgent. The amount available for this purpose in the fiscal year 1935 was more than $10,000 less than in the fiscal years 1931 and 1932. This loss was only half offset by the increase of $5,000 in the funds for the purchase of books in the fiscal year 1936. The loss in the three preceding years and in the present year has impaired the service of the Library to the bureaus and has presented serious difficulties. Adequate library service is essential for the economical conduct of the research and other technical work of the Department.

WORK DONE UNDER THIS APPROPRIATION

This appropriation is used for four main purposes, as follows: (1) For the acquisition of publications needed in the work of the Department; (2) for the work of entering these publications in the permanent catalogues and other records of the Library; (3) for the reference and bibliographical service necessary to make these publications readily available to users of the Library; and (4) for the circulation of material to Department workers and to other libraries and research institutions of the city, and particularly to the State agricultural college and experiment station libraries.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated available, 1937
Agricultural Adjustment Administration (Salaries and Expenses):			
Transferred to Library for reference work and circulation of books and periodicals.....	$1,317	$3,240	$3,240

OFFICE OF EXPERIMENT STATIONS

(a) PAYMENTS TO STATES, HAWAII, ALASKA, AND PUERTO RICO FOR AGRICULTURAL EXPERIMENT STATIONS.

Appropriation Act, 1936	$4,395,000
Second Deficiency Act, 1935	600,000(a)
Total available, 1936	4,995,000
Budget Estimate, 1937	5,620,000
Increase	625,000

(a) For payments to States, Alaska, Hawaii, and Puerto Rico under Bankhead-Jones Act, approved June 29, 1935.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Hatch Act	$ 720,000	$ 720,000	$ 720,000	- - - -
Adams Act	720,000	720,000	720,000	- - - -
Purnell Act	2,880,000	2,880,000	2,880,000	- - - -
Hawaii Station Act	28,000	30,000	50,000	+ 20,000 (1)
Alaska Station Act	15,000	15,000	15,000	- - - -
Puerto Rico Station Act	25,000	30,000	35,000	+ 5,000 (2)
Bankhead-Jones Act	- - -	600,000	1,200,000	+600,000 (3)
Total appropriation	4,388,000	4,995,000	5,620,000	+625,000

The increase of $625,000 for 1937 includes:

(1) An increase of $20,000 to meet the $50,000 authorized for 1937 by the Hawaii Station Act approved May 16, 1928.

(2) An increase of $5,000 to meet the $35,000 authorized for 1937 by the Puerto Rico Station Act approved March 4, 1931.

(3) An increase of $600,000 to meet the $1,200,000 authorized for 1937 by Sections 3 and 5 of the Bankhead-Jones Act approved June 29, 1935.

CHANGE IN LANGUAGE

A new paragraph "For payments to States, Hawaii, Alaska, and Puerto Rico, pursuant to authorizations contained in Title 1 of an Act entitled 'An Act to provide for research into basic laws and principles relating to agriculture and to provide for the further development of cooperative agricultural extension work and the more complete endowment and support of land-grant colleges' approved June 29, 1935 (49 Stat. pp. 436-439), $1,200,000" has been inserted to include the Bankhead-Jones Act approved June 29, 1935.

WORK DONE UNDER THIS APPROPRIATION

The Hatch Act approved March 2, 1887 (U.S.C., title 7, secs. 362,363, 365, 368, 377-379) appropriates $15,000 per annum to each State for Agricultural experiment stations to "aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science."

The Adams Act approved March 16, 1906 (U.S.C., title 7, sec. 369) appropriates $15,000 per annum to each State for the more complete endowment and maintenance of the State agricultural experiment stations "to be applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States."

The Purnell Act approved February 24, 1925 (U.S.C., title 7, secs. 361, 366, 370, 371, 373-376, 380, 382), authorized an appropriation for each State of $20,000 for the fiscal year 1926, an increase of $10,000 over the preceding year for each fiscal year 1927 to 1929, inclusive, and $60,000 per annum thereafter, for the more complete endowment of agricultural experiment stations and for other purposes to be "applied only to paying the necessary expenses of conducting investigations or making experiments bearing directly on the production, manufacture, preparation, use, distribution, and marketing of agricultural products and including such scientific researches as have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry, and such economic and sociological investigations as have for their purpose the development and improvement of the rural home and rural life, and for printing and disseminating the results of said researches.

The Hawaii Station Act approved May 16, 1928 (U.S.C., Supp. VII, title 7, secs. 386-386b) provides that beginning with the fiscal year 1930 the Territory of Hawaii shall be entitled to share in the acts noted above and authorizes appropriations for this purpose as follows: 1930, $15,000; 1931, $20,000; 1932 to 1936, inclusive, $2,000 increase each year over the preceding year; 1937, $50,000; 1938 to 1941, inclusive, $10,000 increase each year over the preceding year; and thereafter $90,000 per year.

The Alaska Station Act approved February 23, 1929 (U.S.C., Supp. VII, title 7, sec. 386c) provides that the Act of March 2, 1887, as amended and supplemented, and known as the Hatch Act, and the Act approved May 8, 1914, and known as the Smith-Lever Act, be and the same are hereby extended to the Territory of Alaska: "Provided, That no appropriations shall be made under this Act until annually estimated as to funds and amounts by the Secretary of Agriculture; the estimates to be based upon his determination of the ability of the Territory of Alaska to make effective use of the funds."

The Puerto Rico Station Act approved March 4, 1931 (U.S.C., Supp. VII, title 7, secs. 386d-386f) provides that beginning with the fiscal year 1933, the Territory of Puerto Rico shall be entitled to share in the Hatch, Adams, and Purnell Acts noted above and authorizes appropriations for this purpose as follows: 1933, $15,000; 1934 to 1940, inclusive $5,000 increase each year over the preceding year; 1941 to 1944, inclusive, $10,000 increase each year over the preceding year; and thereafter $90,000 per year.

The Bankhead-Jones Act: Title I of this Act, approved June 29, 1935 (49 Stat. pp. 436-439), provides as follows: "Section 1. The Secretary of Agriculture is authorized and directed to conduct research into laws and principles underlying basic problems of agriculture in its broadest aspects; research relating to the improvement of the quality of, and the development of new and improved methods of production of, distribution of, and new and extended uses and markets for, agricultural commodities and byproducts and manufactures thereof; and research relating to the conservation, development, and use of land and water resources for agricultural purposes. Research authorized under this section shall be in addition to research provided for under existing law (but both activities shall be coordinated so far as practicable) and shall be conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish.

"Sec. 2. The Secretary is also authorized and directed to encourage research similar to that authorized under section 1 to be conducted by agricultural experiment stations established or which may hereafter be established in pursuance of the Act of March 2, 1887, providing for experiment stations, as amended and supplemented, by the allotment and payment as provided in section 5 to Puerto Rico and the States and Territories for the use of such experiment stations of sums appropriated therefor pursuant to this title.

"Sec. 3. For the purposes of this title there is authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $1,000,000 for the fiscal year beginning after the date of the enactment of this title, and for each of the four fiscal years thereafter $1,000,000 more than the amount authorized for the preceding fiscal year, and $5,000,000 for each fiscal year thereafter. Moneys appropriated in pursuance of this title shall also be available for the purchase and rental of land and the construction of buildings necessary for conducting research provided for in this title, for the equipment and maintenance of such buildings, and for printing and disseminating the results of research. Sums appropriated in pursuance of this title shall be in addition to, and not in substitution for, appropriations for research or other activities of the Department of Agriculture and sums appropriated or otherwise made available for agricultural experiment stations.

"Sec. 4. Forty per centum of the sums appropriated for any fiscal year under section 3 shall be available for the purposes of section 1: Provided, That not to exceed 2 per centum of the sums appropriated may be used for the administration of section 5 of this title. The sums available for the purposes of section 1 shall be designated as the "Special research fund, Department of Agriculture", and no part of such special fund shall be used for the prosecution of research heretofore instituted or for the prosecution of any new research project except upon approval in writing by the Secretary. One-half of such special research fund shall be used by the Secretary for the establishment and maintenance of research laboratories and facilities in the major agricultural regions at places selected by him and for the prosecution, in accordance with section 1, of research at such laboratories.

"Sec. 5. (a) Sixty per centum of the sums appropriated for any fiscal year under section 3 shall be available for the purposes of section 2. The Secretary shall allot, for each fiscal year for which an appropriation is made,

to Puerto Rico and each State and Territory an amount which bears the same ratio to the total amount to be allotted as the rural population of Puerto Rico or the State or Territory bears to the rural population of Puerto Rico and all the States and Territories as determined by the last preceding decennial census. No allotment and no payment under any allotment shall be made for any fiscal year in excess of the amount which Puerto Rico or the State or Territory makes available for such fiscal year out of its own funds for research and for the establishment and maintenance of necessary facilities for the prosecution of such research. If Puerto Rico or any State or Territory fails to make available for such purposes for any fiscal year a sum equal to the total amount to which it may be entitled for such year, the remainder of such amount shall be withheld by the Secretary. The total amount so withheld may be allotted by the Secretary of Agriculture to Puerto Rico and the States and Territories which make available for such year an amount equal to that part of the total amount withheld which may be allotted to them by the Secretary of Agriculture, but no such additional allotment to Puerto Rico or any State or Territory shall exceed the original allotment to Puerto Rico or such State or Territory for that year by more than 20 per centum thereof.

"(b) The sums authorized to be allotted to Puerto Rico and the States and Territories shall be paid annually in quarterly payments on July 1, October 1, January 1, and April 1. Such sums shall be paid by the Secretary of the Treasury upon warrant of the Secretary of Agriculture in the same manner and subject to the same administrative procedure set forth in the Act of March 2, 1887, as amended June 7, 1888.

"Sec. 6. As used in this title the term 'Territory' means Alaska and Hawaii.

"Sec. 7. The Secretary of Agriculture is authorized and directed to prescribe such rules and regulations as may be necessary to carry out this Act.

"Sec. 8. The right to alter, amend, or repeal this Act is hereby expressly reserved."

The Second Deficiency Act, approved August 12, 1935 (Public No. 260, 74th Congress, p. 13), provides: "To carry into effect the provisions of an Act entitled 'An Act to provide for research into basic laws and principles relating to agriculture and to provide for the further development of cooperative agricultural extension work and the more complete endowment and support of land-grant colleges', approved June 29, 1935, as follows: For special research work by the Department of Agriculture, including the employment of persons and means in the District of Columbia and elsewhere, and for payment to the several States, Hawaii, Alaska, and Puerto Rico for research work, pursuant to the authorization contained in title I of said Act, $1,000,000; and for payments to the States and the Territory of Hawaii for cooperative agricultural extension work, pursuant to the authorizations contained in section 21 of title II of said Act, $8,000,000; in all, fiscal year 1936, $9,000,000: Provided, That the Secretary of Agriculture is hereby authorized and directed to ascertain and certify to the Secretary of the Treasury, on or before September 1, 1935, as to Puerto Rico and each State and Territory, whether it has assented to the provisions of the Act of June 29, 1935,

and is entitled to receive its share of the appropriations herein provided: Provided further, That the allotments due July 1, 1935, shall be payable upon such certification by the Secretary of Agriculture to the Secretary of the Treasury (U.S.C., title 5, secs. 511, 512; Act June 29, 1935)."

The allotments to the several States, Alaska, Hawaii, and Puerto Rico for the fiscal years 1936 and 1937 are shown in following table.

Allotments under Section 5, Bankhead-Jones Act

State	1936	1937
Alabama	$20,673.78	$41,347.56
Alaska	559.12	1,118.24
Arizona	3,105.64	6,211.28
Arkansas	15,995.80	31,991.60
California	16,485.49	32,970.98
Colorado	5,607.74	11,215.48
Conn. (State)	2,582.26	5,164.52
Conn. (Storrs)	2,582.26	5,164.52
Delaware	1,252.55	2,505.10
Florida	7,700.41	15,400.82
Georgia	21,880.73	43,761.46
Hawaii	2,296.60	4,593.20
Idaho	3,429.64	6,859.28
Illinois	21,684.13	43,368.26
Indiana	15,680.65	31,361.30
Iowa	16,213.66	32,427.32
Kansas	12,512.74	25,025.48
Kentucky	19,734.51	39,469.02
Louisiana	13,783.36	27,566.72
Maine	5,173.04	10,346.08
Maryland	7,137.62	14,275.24
Massachusetts	4,545,55	9,091.10
Michigan	16,741.96	33,483.92
Minnesota	14,199.41	28,398.82
Mississippi	18,162.85	36,325.70
Missouri	19,241.95	38,483.90
Montana	3,875.79	7,751,58
Nebraska	9,694.15	19,388.30
Nevada	615.16	1,230.32
New Hampshire	2,089.30	4,178.60
New Jersey	7,631.46	15,262.92
New Mexico	3,440.25	6,880.50
New York (Cornell)	20,212.12	40,424.24
New York (State)	2,245,79	4,491.58
North Carolina	25,657.00	51,314.00
North Dakota	6,168,94	12.337.88
Ohio	23,253.69	46,507.38
Oklahoma	17,112.71	34.225.42
Oregon	5,043.95	10,087.90
Pennsylvania	33,672.38	67,344.76
Puerto Rico	12,138.04	24,276.08
Rhode Island	565.96	1,131.92
South Carolina	14,866.24	29,732.48
South Dakota	6,108.11	12,216.22
Tennessee	18,695.97	37,391.94
Texas	37,341.19	74,682.38
Utah	2,625.92	5,251.84
Vermont	2,617.90	5,235.80
Virginia	17,786.14	35,572.28
Washington	7,378.93	14,757.86
West Virginia	13,453.36	26,906.72
Wisconsin	15,056.22	30,112.44
Wyoming	1,689.88	3,379.76
Total	600,000.00	1,200,000.00

(b) SUPERVISION OF AND RELATIONS WITH AGRICULTURAL EXPERIMENT STATIONS

Appropriation Act, 1936	$156,235
Budget Estimate, 1937	161,735
Increase.	5,500

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
Administration and coordination of Federal aid to agricultural experiment stations; assistance in coordination of research work of the Department; assistance in coordination of research work of the Department with that of the State Stations; administration of Department insular stations; and preparation of Experiment Station Record and other publications...	$144,425	$156,235	$161,735	+$ 5,500 (1)
Total obligations.....	144,425	156,235	161,735	+ 5,500
Unobligated:				
Legislative impoundments.....	200	- - - -	- - - -	- - - -
Other amounts unobligated.....	1,112	- - - -	- - - -	- - - -
Total appropriation.....	145,737	156,235	161,735	+ 5,500

(1) The increase of $5,500 is for the purpose of providing an additional associate scientist and a senior clerk-stenographer for work in connection with additional duties and responsibilities assigned to the Chief of the Office of Experiment Stations in assisting in the coordination of the research work of the Department.

3500 2,000

CHANGE IN LANGUAGE

The word "research" has been inserted before, and the words "and coordinate the research work of the Department" after, the words "work of the Department of Agriculture", in view of the more definite assignment to the Chief of the Office of Experiment Stations of authority and responsibility for coordinating the research work of the Department.

WORK DONE UNDER THIS APPROPRIATION

The primary functions and work under this appropriation are:

1. Administration of the Acts of Congress (Hatch Act of 1887, Adams Act of 1906, Purnell Act of 1925, and acts amendatory or supplementary thereto, Hawaii Station Act of 1928, Alaska Station Act of 1929, and Puerto Rico Station Act of 1931) making appropriations for the support of agricultural experiment stations in the States and Territories.

2. Assistance in coordinating the research work of the Department of Agriculture with that of the State and Territorial agricultural colleges and experiment stations.

3. Assistance in coordinating the research work of the Department.

4. Preparation of "Experiment Station Record."

5. The administration and direction of Departmental insular experiment stations--one in Puerto Rico and one in Hawaii.

6. To act as a clearing house for inquiries, running into thousands and coming from all parts of the world, on matters pertaining to agricultural experiment stations and the work of these stations in the United States.

Administration of the acts granting funds to States and Territories involves supervision of the funds, close advisory relations with the stations as to research for which the funds are expended, annual examination of the work and expenditures of each station, coordination of research of the Department with that of State stations, preparation and issuance of "Experiment Station Record" and other reports, and preparation of report to Congress on the work and expenditures of the stations as called for in the acts.

The Federal funds paid to the States and Territories are largely expended on research which is outlined and submitted to the Office of Experiment Stations for advisory suggestions and approval in advance of expenditures. Annual budgets of proposed expenditures on the Federal funds are submitted by each station for review and approval of proposed work and expenditures at the beginning of the fiscal year. Changes and adjustments in work to best meet the State needs are submitted throughout the year. There were 2,039 active Adams and Purnell projects in 1935, of which 424 were new or revised during the year.

To carry out the provisions of the Federal Acts a representative, or representatives, of the Office visits each of the 50 State stations at least once annually and spends three to fifteen days reviewing the expenditures and the research under way. In addition, staff members cooperate as specialists with individual stations and regional groups in consideration of research programs for special fields.

Assistance in coordinating the research of the Department of Agriculture with that of the State and Territorial stations and in coordinating the research work among State stations is constantly in mind when the proposed research projects are reviewed for approval on Federal funds and when the work

and expenditures of each station are reviewed and discussed with the State station directors and research staffs. Through personal conferences and committees having to do with research, close advisory relations are maintained with Bureaus of the Department. Every opportunity is taken to promote effective cooperation between and among the State stations, and between the State stations and the Department. During the fiscal year 1935, approximately 800 cooperative investigations were under way between State stations or State stations and the Department of Agriculture which were carefully planned by the cooperating agencies and made a matter of written cooperative agreement. These cooperative agreements were reviewed by the Office of Experiment Stations and made a matter of record, available to the Department for purposes both of administration and coordination of research activities.

Assistance in coordinating the research work of the Department of Agriculture will be accomplished through advising with the bureau chiefs and the Secretary with regard to coordination and correlation of proposed research. Special attention will be given to adjustments of closely related research in different bureaus and to the coordination and integration of any new research with existing activities of the Department. The work to be done under the Special Research Fund provided by the Bankhead-Jones Act, for example, is to be in addition to regular activities but coordinated with all other research to the maximum extent practicable.

The "Experiment Station Record" was established in 1889 as a part of the Federal-State joint participation in establishing and maintaining agricultural experiment stations. Its purpose is to make available to staff members of all stations and the Department abstracts of current published results of research in this and other countries promptly as an aid in planning research, avoiding duplication, and in coordinating research effort. A total of about 7,000 such abstracts are prepared, edited, and published annually, involving translations from twelve or more languages. The abstract volumes are supplemented by indexes and a combined index for each ten volumes to aid in using the increasing volumes of research findings. Few, if any, of the stations have all the publications available and the abstracting by the Office of Experiment Stations avoids the necessity of duplicate abstracting by the several thousand research workers. As a part of this function, the Office represents the Department's cooperation with Biological Abstracts to the extent of furnishing copies of abstracts of publications by the State stations and the Department.

Administration of the Federal stations in Puerto Rico and Hawaii involves approval of budgets, expenditures, and research projects, review, editing, and approval of publications, and general administrative direction. During the past few years there has developed, in addition, a responsibility for coordination of these Federal stations and their work with the Territorial experiment stations and their research. Hawaii, under the Hawaii Station Act of May 16, 1928, and Puerto Rico, under the Puerto Rico Station Act of March 4, 1931, now receive the benefit of the funds under the Hatch and supplemental Acts. The Acts granting these funds to the Territories, however, provide that the Secretary of Agriculture shall coordinate the work of the Territorial stations and the work of the Federal stations.

Under Puerto Rico and Hawaii Tax Orders approved by the President since April 24, 1935, $113,000 of sugar processing funds has been allotted to the Puerto Rico Station and $410,000 to the Hawaii Station for work along different lines. Many unusual problems in connection with the authorization for expenditures from these funds, the obtaining of personnel and equipment, and other problems in organizing and carrying out the work under the eight separate tax orders have very materially increased the administrative work of the Washington Office.

Inquiries pertaining to agricultural experiment stations in the United States come to the Office of Experiment Stations from all parts of the world. The number amounts to thousands in the course of a year. Requests for information about Alaska, Guam, the Virgin Islands, Puerto Rico, and Hawaii alone have probably exceeded 1,000 in the past year. Inquiries as to organization, personnel, publications, relationships, and work of the stations are many and varied in character. To meet this service in behalf of the Department, an up-to-date list of organization and personnel of the State stations is maintained, and a revised list is published annually. Monthly lists of experiment station publications are mimeographed for use of libraries and to meet inquiries for this information. Other lists, indexes, and compilations of information are prepared as a means of rendering service at a minimum cost.

(c) INSULAR EXPERIMENT STATIONS

Appropriation Act, 1936	$69,311
Budget Estimate, 1937	69,311

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase or decrease
Obligated:				
Hawaii Station	$ 32,881	$ 32,066	$ 12,066	- $20,000 (1)
Puerto Rico Station	35,534	37,245	57,245	+ 20,000 (2)
Total obligations	68,415	69,311	69,311	- - - -
Unobligated:				
Legislative impoundments . . .	200	- - - -	- - - -	- - - -
Other amounts unobligated. . .	321	- - - -	- - - -	- - - -
Total appropriation.	68,936	69,311	69,311	- - - -

There is no change in the total amount for this item, a reduction in the appropriation for the Hawaii Station being offset by a corresponding increase in the funds of the Puerto Rico Station, as follows:

(1) A decrease of $20,000 in the appropriation for the Hawaii Station, which is offset by the increase of $20,000 for 1937 under the Hawaii Station Act under "Payments to States, Hawaii," etc.

(2) An increase of $20,000 for the Puerto Rico Station, to provide additional personnel, equipment, and facilities for use in cooperation with the research bureaus of the Department, so that the station may serve as a tropical outpost station of the Department. This increase will provide for a continuation of the work (1) on the introduction and investigation of important drug plants and studies of insecticidal plants having possibilities for effective use in the control of insect pests in the United States; (2) on introductions and investigations of plants having promise, through selection and improvement, for agriculture in subtropical parts of the United States; and (3) investigations pertaining to phases of animal parasitology which promise results important in the control of parasites in the United States as well as Puerto Rico.

WORK UNDER THIS APPROPRIATION

The agricultural experiment stations of the Department in Hawaii and Puerto Rico were established to determine the agricultural possibilities of the two Territories, to improve and diversify their agriculture, and to develop types of agriculture adapted to different regions. The Hawaii Station Act of May 16, 1928, and the Puerto Rico Station Act of March 4, 1931, provide for the coordination of these stations and their work with the stations of the Territorial agricultural colleges.

Hawaii Station--This station at Honolulu, which is now maintained in cooperation with the University of Hawaii, is concerned with problems relating to the diversification of agriculture and the establishment of industries other than sugar and pineapple production. These major industries have their own experiment stations. Close cooperation is maintained with them on problems of mutual interest. Soil and crop work, horticultural investigations, crop utilization, chemical studies of soils, plant breeding, forage crop studies, dairying, and livestock management constitute the principal activities of the station. These studies are designed to aid the so-called small farmer as contrasted with the plantation system. In the station work, substations have been established on other islands and at greater elevations than the main station for developing systems of agriculture adapted to large areas that are not now profitably utilized. The possibility of extending pineapple cultivation at about 1,000 feet elevation higher than formerly thought possible has been definitely proven. Through the cooperation of Territorial officials and private individuals, experiments have been begun at various elevations up to 5,500 feet. If these prove successful, large areas in the islands can be brought under cultivation. This is very important, since much of the land suited to present agricultural use is under the control of large corporations. Experiments have been begun for the assistance of the coffee industry, and a beginning has been made, in cooperation with the Office of Plant Exploration and Intruduction, Bureau of Plant Industry, to bring together plantings of all available economic tropical plants to study their requirements and adaptability to Hawaii and to limited regions in the United States.

Between August 21 and October 24, 1935, the President approved seven Sugar Processing Tax Orders allotting a total of $410,000 to the Hawaii Agricultural Experiment Station of the Department. These allotments are for taro investigations, liver fluke investigations, a rat abatement program, development of truck farming and important marketing facilities, development of livestock feed, development of tropical fruits and nuts, and promotion of the

poultry industry. The work under the several allotments is being carried out on plans agreed upon by the Hawaiian Agricultural Advisory Committee, the Director of Federal and Territorial Agricultural Experiment Stations, and the Chief of the Office of Experiment Stations.

Puerto Rico Station:--The agricultural experiment station maintained by this Department at Mayaguez, Puerto Rico, since 1902 was established to aid in the improvement and diversification of agriculture in the island. Its principal lines of work have been connected with crop improvement, livestock improvement, introduction of new crops, research on the problems of coffee, sugarcane, citrus fruits, and limited studies of plant diseases, insect pests, animal parasites, soils and fertilizers for Puerto Rico conditions, and agriculture.

In accordance with the Puerto Rico Experiment Station Act of March 4, 1931, the Territory during the fiscal year 1935 received its first payment ($25,000) under the State Experiment Station Act of 1887, and acts supplementary thereto. The Act of 1931 provides authorization for annual increases in this fund until Puerto Rico, in 1944, will receive the amount that each of the States now receives, $90,000 annually. With this change in policy, the experiment station maintained by the Territory can gradually assume increasing responsibility for needed research on the problems of concern to Puerto Rico alone. For a few years until the Territorial station is prepared to take them over, the Department, through its station at Mayaguez, Puerto Rico, will need to continue for Puerto Rico conditions some lines of investigations for which Puerto Rico agriculture has relied almost wholly upon this station, especially investigations in problems of sugar production, coffee production, and animal diseases and parasites.

This change in policy has made possible the designation of the Federal experiment station at Mayaguez as a Federal tropical station of the Department of Agriculture, where all bureaus of the Department may be provided with facilities for study of problems assigned to them for solution and requiring research under tropical conditions. This new objective for the station at Mayaguez contemplates centralizing a considerable part of the tropical research of the Department at this station. Until the fiscal year 1934 this station had not been used as such a Federal Department outpost.

This new policy for the Mayaguez Station contemplates that a phsical plant, including offices, laboratories, housing, and farm equipment, as well as general direction in the carrying out of some phases of the investigations, will be provided by the station to facilitate the use of the tropical station by experts of the Department in many lines without the maintenance of separate plants and without the necessity of many agencies arranging for their own facilities at considerable expense through delays and time involved in becoming acquainted with local conditions.

Under Puerto Rico Tax Fund Order No. 5, approved April 24, 1935 by the President, $113,000 was transferred to the Federal experiment station in Puerto Rico for experimentation in the propagation and breeding of tropical plants and studies of domestic animal parasites. Six lines of work have been set up under these funds as follows: Drug and insecticidal plants, banboo utilization and propagation, tropical economic plant introductions and investigations, tropical field crops, tropical horticultural crops, and animal parasitology.

The work has begun in 1935 and will be continued in 1936 in cooperation with a number of the bureaus of the Department. While planned primarily to benefit Puerto Rico agriculture, this work will contribute to the investigations in the continental United States along similar lines. For example, the work on drug and insecticidal plants may prove of vital importance to continental United States in the unsolved problem of securing insecticides and fungicides which will be effective in the control of insect pests and diseases but without leaving residues harmful to humans. This arrangement is, in fact, a carrying out of the provisions of the Puerto Rico Act of March 4, 1931 as to coordination of research in Puerto Rico and, in addition, makes the Federal station in Puerto Rico available as a Federal tropical station of the Department of Agriculture for much needed facilities in connection with some phases of problems for continental agriculture.

A few such problems of continental United States needing and profiting by research facilities in Puerto Rico are:

1. The problem of developing insecticides and fungicides effective in controlling insect pests and diseases is a major problem in the United States. Findings of the past two years have indicated the possibility of effective poisons being derived from rotenone and related plant species. Beginning in 1934 the Department undertook additional efforts as to the practicability of producing such plants in quantity and at a cost to furnish insecticides and fungicides within economic limits. It is best done under tropical conditions, and propagation and culture has been centered to a large extent at Puerto Rico. In the neighborhood of 5,000 plants have been sent to the Puerto Rican Station through the Office of Foreign Plant and Seed Introduction of the Department. In Puerto Rico they are being studied as to propagation, culture methods, and content of the drugs desired. This project will need to continue over a number of years. If it is not continued at Puerto Rico, the expense at other places will probably be greater.

2. In the investigation looking to the control of insect pests, the Department has already found -

(a) That the ripening of corn every month in the year under Puerto Rican conditions greatly facilitates the study of corn anywhere. A similar advantage will be found in study of other truck crop insects.

(b) In like manner, there would be advantages in studying cotton insects, tobacco insects, and cane insects. These crops are all grown in Puerto Rico.

(c) For some years the Department has maintained work in the tropics in connection with sugarcane breeding and improvement for the United States. Selections of breeding material from all sources can be handled to advantage under tropical conditions.

(d) In the past year the Department has begun certain tropical phases of potato breeding at the Puerto Rican Station. The development of sweet potato varieties from seed requires such tropical conditions. The Department sends the material in cooperation with the Puerto Rican Station, and then arranges cooperative tests and cooperative

service within the State agricultural experiment stations. A cooperative agreement is now in effect to render service of this character to Iowa.

(e) The Puerto Rico Station has assembled to plant introductions probably the best collection of mangoes and certain other tropical and subtropical varieties in the Western Hemisphere. A representative of the Department's subtropical horticulture in Florida took advantage of this collection the past year in his search for possibilities of crop improvement in Florida and other sections of subtropical agriculture in the United States.

In Puerto Rico two crops of cotton can be grown in a year. This fact will speed up certain phases of cotton breeding.

While the above problems are presented from the standpoint of agriculture in the United States, the work would be helpful to Puerto Rico, partly in solving its local agricultural production, and partly, perhaps, in developing new intensive industries, such as drug and insecticidal plants to supply needs in the United States.

Attention is also called to the fact that the appropriation through the Office of Experiment Stations of the Federal experiment station in Hawaii will probably be discontinued with the fiscal year 1938. This will mean that of the Federal stations formerly maintained in Alaska, Guam, Hawaii, and Virgin Islands, all will have been closed, and the only Department station remaining will be the Puerto Rico Station. The maintaining of one Department outpost station in the tropics in behalf of agriculture of the continental United States will greatly facilitate the research work of a number of the bureaus of the Department.

EMERGENCY FUNDS

(1) Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936
Territory of Hawaii Trust Funds (Processing Taxes, Sugar):		
Taro Investigation (Hawaii Tax Order No. 4) . . .	- - -	$ 50,000
Liver fluke eradication (Hawaii Tax Order No. 5)	- - -	40,000
Rat abatement campaign (Hawaii Tax Order No. 6).	- - -	110,000
Development of truck farming and improvement of market facilities (Hawaii Tax Order No. 7) . .	- - -	60,000
Development of livestock feed supplies (Hawaii Tax Order No. 8).	- - -	70,000
Development of tropical fruits and nuts (Hawaii Tax Order No. 9)	- - -	50,000
Promotion of the poultry industry (Hawaii Tax Order No. 10).	- - -	30,000
Puerto Rico Trust Fund (Processing Taxes, Sugar):		
Experiments in propagation and breeding of tropical plants and studies of domestic animal parasites (Puerto Rico Tax Order No. 5)	$ 1,598	111,402
Total	1,598	521,402

WORK UNDER TRUST FUND ALLOTMENTS

Under Section 15 of the Agricultural Adjustment Act, approved May 12, 1933 (48 Stat. 31), as amended by Section 8 of the Act approved May 9, 1934 (Public, No. 231, 73rd Cong.), the President has approved tax-fund orders allotting funds for the Puerto Rico and Hawaii Agricultural Experiment Stations of the Office of Experiment Stations, as shown in the table of allotments above. The work in Puerto Rico has been set up along lines agreed upon by the Chief of the Office of Experiment Stations, the Director of the Puerto Rico Experiment Station of the Department, chiefs of various bureaus of the Department, the Governor of Puerto Rico, the chancellor of the University of Puerto Rico, and the director of the Puerto Rico Agricultural Experiment Station. It includes work on bamboo, rotenone-producing plants, vanilla production, livestock and poultry parasites, vegetables and fruits, the introduction of promising plants, etc.

The work in Hawaii under the several orders will be conducted on projects agreed upon by the Hawaii Agricultural Advisory Committee (which includes among others the Governor of Hawaii and the President of the University of Hawaii), the director of the Federal and Territorial Agricultural Experiment Stations, and the Chief of the Office of Experiment Stations. The projects will cover different phases and investigations and other work on taro, liver fluke, rat abatement, truck farming and marketing, livestock feed, tropical fruits and nuts, and the poultry industry.

PASSENGER-CARRYING VEHICLES

Puerto Rico Station--Authority is requested for the purchase of 2 cars. These are needed to afford facilities for the research staff of the Puerto Rico Station in conducting the work jointly with and in coordination with that of the experiment stations of the College of Agriculture of the University of Puerto Rico. The investigations will be located at the Federal station at Mayaguez, the insular stations at Rio Piedras and Isabela, the insular demonstration farms, and other places in the island. The carrying on of the joint research will necessitate frequent trips of the Director and other members of the technical staff from Mayaguez to the other stations and to points throughout the island. The poor transportation facilities in the island make is essential that automobiles be available so that the research work throughout the island will not be impeded.

Hawaii Station--Authority is requested for the purchase of 1 car. The Hawaii Station has but one passenger-carrying car. It was purchased in 1933 and is in such condition that it can not be relied upon for the longer and more important trips which are necessary for the Director and other technical men to make. While the old car will be retained for shorter trips, a new car should be provided for the Director and technical staff in visiting the outlying work and carrying out the duties in connection with the administration of the work.

SPECIAL RESEARCH FUND, DEPARTMENT OF AGRICULTURE

Second Deficiency Act, 1935 (available for 1936).....	$ 400,000 (a)
Budget Estimate, 1937.....	800,000
Increase.....	$ 400,000

(a) Authorized by Bankhead-Jones Act approved June 29, 1935.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Administration of Sec. 5, Act of June 29, 1935	-----	$ 8,000	$ 16,000	+ $ 8,000
Special research projects, Department of Agriculture	-----	192,000	384,000	+ 192,000
Special research laboratories in major agricultural regions. . .	-----	200,000	400,000	+ 200,000
Total appropriation. . . .	-----	400,000	800,000	+ 400,000(1)

(1) The increase of $400,000 for 1937 is for the purpose of meeting the authorizations totaling $800,000 provided for by Sections 3 and 4 of the Bankhead-Jones Act approved June 29, 1935. (See Office of Experiment Stations for full text of Title I and the part of Second Deficiency Act, 1935, making appropriation for 1936).

WORK DONE UNDER THIS APPROPRIATION

Administration of Section 5 of Act of June 29, 1935--The administration of Section 5 of the Bankhead-Jones Act, which provides for allotments to States, will be conducted along the same general lines as the administration of the Hatch, Adams, Purnell, Hawaii, Alaska, and Puerto Rico Station Acts. Such administration includes examination and approval of research proposals in advance of the expenditure of funds, review of work and expenditures at each station as a basis for ascertaining and certifying the respective State or Territory to receive Federal funds, assistance in coordinating research of the various stations and the research of the stations with that of the Department, annual report to the Secretary and Congress on work and expenditures under the Act, and close advisory relations with the State and Territorial stations.

Administration of the Bankhead-Jones Act will differ from administration of the other acts on a few important points:

1. No allotment of Bankhead-Jones funds can be made to a State or Territory in excess of the amount the State or Territory makes available from other than Federal funds for research during the year in question. This means a direct important responsibility of administration not included in any of the other acts.

2. The States and Territories may include as a part of their research offset expenditures during the year for physical plant and equipment. This provision also imposes a considerable additional responsibility upon the administration of the Federal grant.

3. The Bankhead-Jones Act authorizes use of the funds for physical plant, including purchase and rental of land, construction of buildings, and for equipment and maintenance of such buildings. There is no limitation as to the portion of the funds which may be used for these purposes. The expenditures, however, are limited to those necessary for the research under this Act. Administration of this provision is an important responsibility in addition to those required under the other acts.

As a whole, the Bankhead-Jones Act to be effectively administered will require relatively more time, more responsibility, and relatively much greater expense than any of the other acts.

Special Research Projects, Department of Agriculture--Approximately one-half of the Special Research Fund is available to the Secretary of Agriculture for financing such research projects as he may decide upon within the scope set forth by Section 1 of the Act. The work under this sub-item includes planning, programming, coordinating, and the carrying out of such special research projects as the Secretary may decide to undertake with this fund in a way to effectively integrate this research with research and other activities provided for in the regular appropriations to the Department. The Act requires that the research under this fund "shall be in addition to research provided for under existing law (but both activities shall be coordinated as far as practicable) and shall be conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish".

The general plan is to have the cooperation of all Bureaus in bringing before the Secretary problems suitable for research under the provisions of this Act. From the combined suggestions and recommendations, the Secretary, with such advisory assistance as he may call for, will select problems for research. These problems will be assigned to a Bureau, or Bureaus, or to a group of specialists, for development of plans and estimates for further consideration by the Secretary before final decision is made as to the research to be undertaken. The projects finally decided upon will probably be assigned to an existing bureau or bureaus, along with an allotment of funds to the respective bureau or bureaus to provide for carrying forward the research outlined and estimated for in the written project outline approved by the Secretary, in accordance with the requirement of the Act.

Special Research Laboratories in Major Agricultural Regions--The Bankhead-Jones Act provides that the Secretary of Agriculture shall use one-half of the Special Research Fund for establishment and maintenance of research laboratories and facilities, and for research as described by the Act at such laboratories, at places selected by the Secretary in major agricultural regions. The work under this item will involve decision as to problems for which laboratories should be established under the provisions of this Act; the plan of the research program for each such laboratory; the working out of relationships with the State experiment stations in the major agricultural region having such a laboratory, or where such a laboratory is proposed, in order to coordinate this work with work under regular Federal and State activities; and carrying forward the research program finally approved.

The general plan is to secure from directors of State experiment stations, and from chiefs of bureaus in the Department, suggestions as to such laboratories. With this information available the Secretary, with such assistance as he may call for, will decide upon the laboratory projects to be undertaken, and the agencies of the Department to which the responsibility for the laboratory and the research work is to be assigned. It is contemplated that such laboratories will be established and operated in a way that the research undertaken, as far as practicable, will be coordinated with the regular activities of the Department and the work of the State experiment stations.

PASSENGER-CARRYING VEHICLES

Section 4 of the Act approved June 29, 1935, provides that one-half of the Special Research Fund shall be used in establishing and maintaining research laboratories and facilities in the major agricultural regions. During the fiscal years 1936 and 1937 it is planned to establish five or six such laboratories. At least one passenger-carrying automobile will be necessary at each laboratory and in the case of those established in the larger regions two or more such vehicles, to enable the directors and their technical assistants to visit the different parts of the regions, confer with cooperating State experiment stations, and carry out administrative and other duties.

The establishment of various lines of new research work by the Department such as the investigation of the farm storage problems of grain, the development of sheep suitable for southwestern ranges, etc., will necessitate that automobiles be provided for use in the field by the leaders and their assistants at at least four such projects, to enable them to collect data, confer with cooperating agencies, and carry out the projects efficiently and in coordination with other research as provided for in Section 1 of the Act.

EXTENSION SERVICE

Payments to States, Hawaii, Alaska and Puerto Rico for Agricultural Extension Work.

General Statement

Funds available for direct payments to the States, Hawaii, Alaska, and Puerto Rico for cooperative agricultural extension work for 1936 total $16,758,096. This sum includes an automatic increase of $10,000 in the permanent annual appropriation (Smith-Lever Act) provided by the Act of March 4, 1931 (Public No. 486 - 71st Congress), entitled "An Act to coordinate the agricultural experiment station work and to extend the benefits of certain Acts of Congress to the Territory of Puerto Rico", and an item of $8,000,000 for cooperative agricultural extension work provided in the Second Deficiency Act, 1935 (August 12, 1935, 49 Stat. p.571). This latter appropriation was authorized by the Bankhead-Jones Act of June 29, 1935 (49 Stat. pp 436-439) entitled, "An Act to provide for research into basic laws and principles relating to agriculture and to provide for the further development of cooperative agricultural extension work and the more complete endowment and support of land-grant colleges".

In addition to the sums indicated above for 1936, there was available $195,540 to the States, Hawaii, and Puerto Rico from appropriations direct to the Department of Agriculture ($145,000 from Farmers' Cooperative Demonstrations and $50,540 from Clarke-McNary forestry funds), making a grand total of $16,953,636 available to the States and Territories for 1936.

Under the estimates for 1937, the proposed payments to the States, Hawaii, Alaska, and Puerto Rico total $17,125,014. This sum includes an automatic increase of $10,000 for Puerto Rico under the permanent appropriation (Smith-Lever Act), an increase of $1,000,000 under the Bankhead-Jones Act, and $1,918 under the Alaska Act. The total increase is $1,001,918 but, as State payments are to be reduced by $645,000 ($395,000 from Supplemental Smith-Lever and $250,000 from Additional Cooperative Agricultural Extension Work), the net increase is $356,918.

The estimates provide that the Department's contributions to States and Territories under the appropriation item "Farmers' Cooperative Demonstrations" will be reduced by $45,000 ($44,000 transferred to Washington office; $1,000 reduction in appropriation). With this change, the direct Department funds made available to the States and Territories (Farmers' Cooperative Demonstrations and Clarke-McNary funds) would be $150,540.

To summarize, the 1937 estimates contemplate funds for States and Territories as follows:

Federal grants	$17,125,014
From direct appropriations	150,540
Total for States and Territories . .	$17,275,554

The use of these funds is indicated in greater detail in Tables 1 and 2.

Table 1. Statement showing appropriation items and amounts available to the States in 1935, 1936, and estimated for 1937

Item	Appropriation 1935	Appropriation 1936	Budget Estimate 1937
Payments to States, Hawaii, Alaska, and Puerto Rico for agricultural extension work:			
Supplementary Smith-Lever	$ 1,567,362	$ 1,580,000	$1,185,000(1)
Capper-Ketcham Act (Act of May 22, 1928)	1,474,800	1,480,000	1,480,000
Bankhead-Jones Act (Act of June 29, 1935)	-	8,000,000	9,000,000(2)
Alaska (Act of February 23, 1929)	12,000	12,000	13,918(3)
Additional Cooperative Extension Work	993,000	1,000,000	750,000(4)
Total, Agricultural Act	4,047,162	12,072,000	12,428,918
Permanent Annual Smith-Lever appropriation	4,676,096	4,686,096	4,696,096
Total payments made directly to States and Territories	8,723,258	16,758,096	17,125,014
Amounts allotted to States and Territories but disbursed by Department of Agriculture:			
Farmers' Cooperative Demonstrations: Cooperative agricultural extension work	202,312	145,000	100,000(5)
Cooperative Farm Forestry (Clarke-McNary Act of June 7, 1924)	44,082	50,540	50,540
Total allotments to States and Territories by Department	246,394	195,540	150,540
Total of direct payments to States and Territories, and Department allotments to States and Territories	8,969,652	16,953,636	17,275,554

(1) $395,000 decrease in direct payments to the States and Territories.

(2) $1,000,000 increase as authorized by Bankhead-Jones Act, to provide additional personnel needed in many States if extension work is to be available to all rural people and if the cooperative extension service in the States is to carry the greatly increased burden of work resulting from the assistance requested of the Extension Service by the Federal agencies recently created.

(3) $1,918 increase to provide for additional funds in Alaska, bringing the appropriation up to the maximum authorized in the Act of Feb. 23, 1929, which is greatly needed by recent developments in the Territory.

(4) $250,000 decrease in direct payments to the States and Territories.

(5) $45,000 decrease in State allotments (1937 below 1936) represents a reduction of $1,000 in appropriation funds and a transfer of $44,000 to provide for an increase in Department funds to take care of additional professional and clerical assistance needed in connection with the supervision of the increased extension work.

With the exception of the $9,000,000 provided by the Bankhead-Jones Act to augment the Cooperative Agricultural Extension funds, the $750,000 designated for "Additional Cooperative Extension Work" and funds allotted by this Department under its direct appropriations entitled "Farmers' Cooperative Demonstrations" and "Cooperative Farm Forestry", the major part of extension moneys are distributed on the basis of rural population, computed on the proportion that the rural population of each State bears to the total rural population of the United States. Bankhead-Jones funds, (with the exception of $20,000 to each State and Hawaii) are allotted on the basis which the farm population of each State and Hawaii bears to the total farm population of the United States and Hawaii. The $750,000 appropriation for "Additional Cooperative Extension Work" specifies payment to each State and the Territory of Hawaii in accordance with the apparent need as determined by the Secretary of Agriculture. Funds directly disbursed by the Department are also allotted at the discretion of the Secretary. The following Table No2 indicates the funds paid to the States and Territories that require offset by State money, those where such offset is not required, and the basis of allotment.

Table No. 2. Statement of direct payments to States, Hawaii, Alaska, and Puerto Rico, indicating those requiring offset by States and Territories, those not requiring such offset, and basis of distribution, as estimated for 1937.

Item	Total Estimate 1937	Amount to be paid without offset	Amount requiring offset and basis of allotment	
			Amount	Basis of distribution
(1) Permanent annual appropriation (Smith-Lever Act).....	$4,696,096	$ 500,000 (a)	$ 4,196,096	Rural population
(2) Supplemental Smith-Lever Act.....	1,185,000	-	1,185,000	Rural population
(3) Capper-Ketcham Act....	1,480,000	980,000 (b)	500,000	Rural population
(4) Bankhead-Jones Act...	9,000,000	9,000,000 (c)	-	Farm population
(5) Alaska Act.....	13,918	10,000 (d)	3,918	Rural population when recommended by Department
(6) Additional Cooperative Extension Work.....	750,000	750,000	-	Determined by Secretary of Agriculture.
Total, direct Federal payments.....	17,125,014	11,240,000	5,885,014	

(a) $10,000 to each State, Hawaii, and Puerto Rico.
(b) $20,000 to each State and Hawaii.
(c) $20,000 to each State and Hawaii (balance based on farm population; no offset).
(d) Based on special authorization.

The Federal funds for cooperative agricultural extension work are supplemented by funds from within the States estimated at $11,785,321, thus making available from Federal, State, and local sources for extension work during 1936 a sum approximating $28,716,804. (See Table 3).

Table 3. Total allotments to States and Territories from Federal (including U.S.D.A.) and State sources for extension work, fiscal year 1936.

State	Total	Total Federal funds	Total within the States
Alabama	834,905.72	592,308.99	242,596.73
Arizona	167,655.48	116,920.48	50,735.00
Arkansas	774,574.78	515,519.78	259,055.00
California	927,907.82	382,363.92	545,543.90
Colorado	313,281.77	212,131.99	101,149,78
Connecticut	298,459.76	130,792.91	167,666.85
Delaware	92,991.28	74,036.75	18,954.53
Florida	410,991.65	219,347.67	191,643.98
Georgia	998,037.44	661,717.06	336,320.38
Idaho	273,527.49	155,706.82	117,820.67
Illinois	1,036,968.85	542,579.39	494,389.46
Indiana	799,874.19	431,857.34	368,016.85
Iowa	1,049,880.67	476,770.16	573,110.51
Kansas	745,595.00	379,134.55	366,460.45
Kentucky	802,947.89	549,970.89	252,977.00
Louisiana	655,533.93	415,545.26	239,988.67
Maine	239,746.93	155,945.86	83,801.07
Maryland	370,921.16	196,855.96	174,065.20
Massachusetts	480,908.89	138,496.00	342,412.89
Michigan	708,390.77	419,035.68	289,355.09
Minnesota	627,629.16	427,254.18	200,374.98
Mississippi	892,120.64	572,744.24	319,376.40
Missouri	746,128,98	543,124.73	203,004.25
Montana	344,441.01	174,416.01	170,025.00
Nebraska	506,076.90	345,231.78	160,845.12
Nevada	129,652.34	73,060.89	56,591.45
New Hampshire	222,551.78	94,702.66	127,849.12
New Jersey	394,535.46	172,671.06	221,864.40
New Mexico	212,659.83	136,378.89	76,280.94
New York	1,535,800.08	466,162.35	1,069,637.73
North Carolina	1,019,519.31	706,364.29	313,155.02
North Dakota	360,492.38	244,967.10	115,525.28
Ohio	964,703.90	540,064.90	424,639.00
Oklahoma	723,564.07	499,023.50	224,540.57
Oregon	401,048.94	186,214.82	214,834.12
Pennsylvania	1,018,850.30	607,999.75	410,850.55
Rhode Island	80,253.22	60,050.13	20,203.09
South Carolina	603,318.99	436,478.89	166,840.10
South Dakota	318,180.33	253,739.30	64,441.03
Tennessee	809,109.81	567,642.81	241,467.00
Texas	1,714,749.36	1,054,095.01	660,654.35
Utah	182,997.86	122,023.86	60,974.00
Vermont	208,919.95	114,259.95	94,660.00
Virginia	802,009.79	496,232.99	305,776.80
Washington	296,291.82	218,443.48	77,848.34
West Virginia	464,766.88	302,113.88	162,653.00
Wisconsin	628,944.25	423,279.86	205,664.39
Wyoming	178,343.65	109,566.69	68,776.96
Alaska	16,000.00	12,000.00	4,000.00
Hawaii	136,146.56	111,917.21	24,229.35
Puerto Rico	193,895.00	92,220.00	101,675.00
Total	28,716,804.02	16,931,482.67	11,785,321.35

As the major purpose of these payments of money to States is the employment of extension workers in counties and colleges, the following comparative statement is submitted showing agents employed:

Table 4. Extension field agents employed June 30, 1933, 1934, and 1935, and September 30, 1935.

	June 30, 1933.	June 30, 1934.	June 30, 1935.	Sept. 30, 1935.
State Supervisors.....	475	512	539	554
Subject-Matter Specialists:				
Full-time specialists.....	863	853	860	1049
Part-time specialists	216	258	306	361
Special A.A.A. State workers.....	-	-	95	76
Total specialists.....	1,079	1,111	1,261	1,486
Total with headquarters at colleges	1,554	1,623	1,800	2,040
County Workers:				
Agricultural Agents.....	2,450	3,167	3,290	3,400
Home demonstration agents.....	1,221	1,267	1,309	1,333
Boys' and girls' club agents.....	201	185	244	242
Negro extension agents.....	314	307	326	331
Special A.A.A. county workers....	-	-	889	840
Total county workers	4,186	4,926	6,058	6,146
Total.....	5,740	6,549	7,858	8,186

Number of counties in United States 3,077
Approximate number of counties now having one or more agents..... 2,850

A discussion of the activities under the various appropriation items and tabulation of amounts involved under each, follows:

(a) COOPERATIVE AGRICULTURAL EXTENSION WORK
(Supplemental Smith-Lever Appropriation)

Appropriation Act, 1936	$ 1,580,000
Budget Estimate, 1937	1,185,000
Decrease.	395,000

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Decrease
Obligated:				
Payments to States and Hawaii for cooperative agricultural extension work (Supplemental Smith Lever).....	$1,567,362	$1,580,000	$1,185,000	$-395,000(1)
Unobligated				
Payments withheld through failure to offset Federal funds (Rhode Island, $298; South Carolina, $12,340).....	12,638	-	-	-
Total appropriation.....	1,580,000	1,580,000	1,185,000	-395,000(1)

(1) The decrease of $395,000 for 1937 represents a reduction in direct payments to States and Hawaii for cooperative agricultural extension work. The estimate contemplates a reduction of 25% for 1937 to be followed by similar reductions in 1938, 1939, and 1940, the 4 years during which the increases authorized by the Bankhead-Jones Act are coming into effect.

WORK DONE UNDER THIS APPROPRIATION

These funds supplement the permanent annual appropriation provided under the Smith-Lever Act (May 8, 1914, Stat. 372-374, U.S.C. 114). Like the Smith-Lever funds, they are paid directly to the State colleges of agriculture as Federal aid for the promotion of extension work in agriculture and home economics. This appropriation is divided among the States and Hawaii in the proportion that the rural population of each bears to the total rural population of the States and Hawaii, and is available only when offset by funds from within the States. This item contains a provision that not more than $300,000 may be expended for purposes other than salaries of extension agents in counties. As $300,000 is approximately 25 percent of the total appropriation, this means that approximately 75 percent of the funds must be expended for salaries of county extension agents. The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(b) COOPERATIVE AGRICULTURAL EXTENSION WORK
(Capper-Ketcham Act)

Appropriation Act, 1936.	$1,480,000
Budget Estimate, 1937.	1,480,000

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Payments to States and Hawaii for Further Development of Cooperative Agricultural Extension Work (Capper-Ketcham Act).....	$1,474,800	$1,480,000	$1,480,000
Unobligated:			
Payments withheld through failure to offset Federal funds (South Dakota).....	5,200	-	-
Total appropriation.....	1,480,000	1,480,000	1,480,000

WORK DONE UNDER THIS APPROPRIATION

This appropriation is specifically authorized by the provisions of the Capper-Ketcham Act of May 22, 1928 (45 Stat., 711, 712), which authorizes an appropriation of $980,000 to be divided at the rate of $20,000 to each State and to Hawaii, without requirement for State offset, and an additional $500,000 to be divided among the States and Hawaii on the basis of rural population. The Act further provides that at least 80 percent of the funds appropriated under this authorization shall be expended for salaries of county extension agents and that the extension agents appointed under its provisions shall be men and women in fair and just proportions. The State allotments are paid directly to a designated officer in the State and Hawaii and are disbursed in accordance with budgets and plans of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States and Hawaii from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(c) COOPERATIVE AGRICULTURAL EXTENSION WORK
(Bankhead-Jones Act)

Second Deficiency Act, 1935 (available for 1936)	$8,000,000(a)
Budget Estimate 1937	9,000,000
Increase	1,000,000

(a) Authorized by Bankhead-Jones Act of June 29, 1935.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Payments to States and Hawaii for cooperative agricultural extension work (Bankhead-Jones Act)	---	$ 8,000,000	$ 9,000,000	$ 1,000,000(1)

(1) An increase of $1,000,000 for 1937 is authorized by the Bankhead-Jones Act of June 29, 1935, and is needed to provide additional personnel in the various States and Hawaii if extension work is to be available to all rural people and if the cooperative extension service in the States is to carry the greatly increased burden of work resulting from the assistance requested of the Extension Service by the Federal agencies recently created.

WORK DONE UNDER THIS APPROPRIATION

This appropriation is specifically authorized by the provisions of Title II, Section 21, of the Bankhead-Jones Act of June 29, 1935, which augments the cooperative agricultural extension funds provided by the Smith-Lever Act of 1914, the Capper-Ketcham Act of May 22, 1928, and supplementary extension appropriations. Eight million dollars was authorized and appropriated for the fiscal year 1936, and increases of $1,000,000 are authorized each year for the succeeding four years, making the final total amount to be appropriated to the land-grant colleges for cooperative agricultural extension under this Act $12,000,000 in the fiscal year 1940 and thereafter. It is available to the States only after they have met the required State offset to Smith-Lever and Capper-Ketcham Acts and Supplementary Smith-Lever appropriations. Under the Bankhead-Jones Act there is allotted to each State and Hawaii $20,000 flat. The remainder of the fund is then allotted to each State and Hawaii on the basis which the farm population of each State and Hawaii bears to the total farm population of the United States and Hawaii. No State offset is required for any of the funds under this Act. The State allotments are paid directly to a designated officer in the State and the Territory of Hawaii and are disbursed in accordance with budgets and plans of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States and Hawaii from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(d) EXTENSION OF SMITH-LEVER ACT TO ALASKA

Appropriation Act, 1936.	$12,000
Budget Estimate, 1937.	13,918
Increase.	1,918

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Payments to Alaska for the extension of the Smith-Lever Act to Alaska	$ 12,000	$ 12,000	$13,918	$1,918 (1)

(1) The increase of $1,918 for 1937 provides for additional funds to Alaska, bringing the appropriation up to the maximum authorized in the Act of February 23, 1929. Due to recent developments in Alaska, the need for extension work there has greatly increased. At the present time there are only three extension workers in the Territory, namely, the director of extension, who also handles work in agriculture; an assistant director for home economics, and an extension veterinarian. The full amount to which Alaska is entitled under the provisions of the Smith-Lever Act is $13,918.60, but the annual appropriations so far have been $12,000. At the time the first appropriations under this Act were made to Alaska, the available funds for cooperation on the part of the Territory of Alaska amounted to $2,000 annually. As any amount appropriated over $10,000 for extension work in Alaska requires matching, the total appropriation requested was $12,000. For the past several years, Alaska has appropriated $4,000 annually for extension work, and is now in position to match the full amount to which the Territory is entitled.

WORK DONE UNDER THIS APPROPRIATION

This appropriation is authorized by the Act approved February 23, 1929, entitled "An Act to extend the benefits of the Hatch Act and the Smith-Lever Act to the Territory of Alaska" (U.S.C.Supp. VI, title 7, Sec. 386c). The extension work in agriculture and home economics is of a similar nature to that which is being conducted in the States, modifications being made to suit local conditions. Experiment stations have been maintained by the Federal Government in Alaska for many years, but extension work was not systematically begun among farmers until 1931. The allotments are paid directly to a designated officer in the Territory and are disbursed in accordance with budgets and plans of work submitted by the director of extension and approved by the Secretary of Agriculture. Expenditures are subject to an annual inspection by representatives of the Department.

(e) ADDITIONAL COOPERATIVE AGRICULTURAL EXTENSION WORK

Appropriation Act, 1936.....	$1,000,000
Budget Estimate, 1937.....	750,000
Decrease.....	250,000

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Decrease
Obligated:				
Payments to States and Hawaii for additional cooperative agricultural extension work.	$ 993,000	$ 1,000,000	$ 750,000	$ -250,000(1)
Unobligated:				
Payment withheld through failure to offset Federal funds (South Dakota).	7,000	-	-	-
Total appropriation.	1,000,000	1,000,000	750,000	-250,000(1)

(1) The decrease of $250,000 for 1937 represents a reduction in direct payments to States and Hawaii. The estimate contemplates a reduction of 25% in 1937, to be followed by similar reductions in 1938, 1939 and 1940, the 4 years in which the increases authorized by the Bankhead-Junes Act are coming into effect.

WORK DONE UNDER THIS APPROPRIATION

This project provides for additional cooperative agricultural extension work, including employment of specialists in economics and marketing, to be allotted by the Secretary of Agriculture to the several States and the Territory of Hawaii in such amounts as he may deem necessary to accomplish such purposes.

These funds supplement the permanent annual appropriation provided under the Smith-Lever Act (Act of May 8, 1914), as well as those funds provided under the Capper-Ketcham Act (Act of May 22, 1928). Like the Smith-Lever and Capper-Ketcham funds, they are paid direct to the State colleges of agriculture as Federal aid for extension work in agriculture and home economics. However, as already indicated, the payments of funds to the States, instead of being based upon the ratio that the rural population of each State bears to the total rural population of the States and Hawaii, are subject to determination by the Secretary of Agriculture as to the amount that he may deem necessary to accomplish the best results in each State. The State allotments are paid directly to a designated officer in the States and Hawaii and are disbursed in accordance with budgets and plans of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States and Hawaii from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

Direct Appropriations to the Department

(f) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1936	$ 13,668
Allotment for General administrative expenses from "Farmers' cooperative demonstration work"..	112,578
Total Available, 1936	126,246
Budget Estimate, 1937	126,246 (1)

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
General administrative and business service	$ 122,439	$ 126,246	$ 126,246
Unobligated:			
Savings	211	---	---
Total	122,650 (a)	126,246	126,246 (1)

(1) The total Budget estimate for 1937 includes $112,578 by transfer from "Farmers' cooperative demonstration work" which appropriation is reduced accordingly for 1937. Since the organization of the Extension Service in 1923, the major portion of the cost of business administration of the Extension Service has been paid from the "Farmers' cooperative demonstration work" appropriation. In order to conform to the appropriation set-up for other bureaus and to the uniform project system of the Department, it is now proposed to transfer such costs to "General administrative expenses".

WORK DONE UNDER THIS APPROPRIATION.

This appropriation provides the Director of Extension Work with personnel and funds essential to the proper supervision and general business operations of the Extension Service, comprising the Office of the Director, Division of Cooperative Extension, Division of Motion Pictures, Division of Exhibits, and a large cooperative field force. Its continuance is essential to the proper administration of such work.

(a) For 1935 includes allotment of $106,400 from "Farmers Cooperative Demonstration Work."

(g) FARMERS' COOPERATIVE DEMONSTRATION WORK

Appropriation Act, 1936		$747,248
Less allotments for 1936 for the following items estimated under other heads for 1937:		
"General Administrative Expenses". .	$112,578	
"Motion Pictures"	79,000	-191,578
Available, 1936		555,670
Budget Estimate, 1937		554,670 (1)
Decrease		1,000 (1)

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase or decrease
Obligated:				
1. Technical advice and assistance in subject-matter fields to State extension forces	$234,416	$296,800	$333,000	+36,200
2. Studies of extension methods and assistance in training courses for State extension forces	37,159	46,720	49,920	+ 3,200
3. Preparation and distribution of visual material and extension literature to Department and State extension forces	59,268	67,150	71,750	+ 4,600
4. Allotments to States for cooperative agricultural extension work .	202,312	145,000	100,000	-45,000
Total Obligations	533,155	555,670	554,670	- 1,000
Transfer to Treasury Department . . .	1,620	---	---	---
Unobligated:				
Legislative impoundments and savings	13,721	---	---	---
Total	548,496	555,670	554,670	- 1,000(1)

(1) The Budget estimate for 1937 includes a transfer of $191,578 of funds heretofore allotted for "General administrative expenses" and "Motion Pictures," which are estimated for 1937 under those headings, and an actual reduction of $1,000 in this appropriation.

Adjustments between the projects also occur as indicated in the Project Statement. These adjustments are necessary to provide professional and clerical assistance urgently needed for supervision of increased extension work. During the current fiscal year, funds for the various States and Hawaii totaling $8,000,000 were made available under the authorization of the Bankhead-Jones Act, but no

provision was made for the resulting increase in essential supervisory duties; and since the beginning of the emergency programs the increased demands upon the Extension Service have been such that it has been seriously handicapped by lack of personnel for giving necessary supervision, advice, and assistance to extension field workers.

WORK DONE UNDER THIS APPROPRIATION

General.--This appropriation provides funds for administration of cooperative extension work conducted in continental United States and the Territories of Alaska, Hawaii, and Puerto Rico and the maintenance of the necessary professional and clerical staff in the District of Columbia. It supplements, by allotment of money to States and Territories, the funds provided by other legislation for cooperative agricultural extension work. This appropriation is, therefore, a very necessary and vital part of the cooperative agricultural extension system, and its continuance is necessary to the proper conduct of this important phase of the Department's work.

Technical Advice and Assistance in Subject-Matter Fields to State Extension Forces.--This project covers the cost of maintenance of four regional administration sections (North Central, Northeastern, South and Western), a section of subject-matter specialists, and a section of agricultural economists. The staff of the regional sections is essential to the efficient field administration of extension work, the inspection of expenditures under Federal grants in various States, and the coordination of all extension work in the field. The subject-matter specialists and economic extension staff carry to the State extension services the findings of the research bureaus of the Federal Department and assist them to incorporate such facts in their State programs. They carry information of value also, from State to State, along the lines of agriculture and home economics.

Studies of Extension Methods and Assistance in Training Courses for State Extension.--The work under this project is very essential as the Extension Service originates, plans, and conducts in cooperation with other sections of the Federal extension service and the various State extension services field and office studies aimed at the development of a scientific body of information which will aid in the further development of agricultural extension, home economics extension, and boys' and girls' 4-H Club work and increase the efficiency of extension workers engaged in these lines of work; promotes and assists the development of more adequate professional training of extension workers - both for those planning to enter the work and for those already in the service; records and measures the accomplishments of the cooperative extension system, and analyzes and interprets the results obtained in terms of teaching activities and educational progress.

Preparation and Distribution of Visual Material and Extension Literature to Department and State Extension Forces.--Under this project, the Extension Service maintains such activities as its photographic library, editorial unit, writers for preparation of special educational material, lantern slides and film strips, and similar informational functions. Service in connection with informational and illustrative material is rendered to the approximately 7,000 extension field workers. All annual reports and similar data are prepared under

this project. The results of this activity are far-reaching and important and the project should be continued.

Allotments to States for Cooperative Agricultural Extension Work.--Under this project funds are made available to the various States, Hawaii, and Puerto Rico to supplement salaries of field extension workers. These funds help to adjust inequities in Federal grants due to the distribution of such funds on the basis of population. Through payment of direct salaries to extension agents, they tend also to bring about a closer relationship with the Federal Department of Agriculture by reason of Federal appointment. Such appointment likewise carries with it the free mailing privilege and benefits of the Federal Compensation Act. The countinuance of funds for the purposes mentioned is considered important and necessary.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
AGRICULTURAL ADJUSTMENT ADMINISTRATION FUNDS:			
I. Technical assistance to Extension Service (Washington office) on agricultural adjustment programs.			
Salaries and Expenses, Agricultural Adjustment Administration			
1. For the services of an extension economist to assist in the formulating of marketing agreements and in the educational and administrative work in connection with them in the field, as related to the programs of the A.A.A.	$ 3,550	$ 6,600	$ 6,600
2. For the services of a scientific illustrator to assist in the preparation of visual material in connection with the art requirements of the Division of Information of the A.A.A.	450	1,800	1,800
Total, Salaries and Expenses, Agricultural Adjustment Administration. . . .	4,000	8,400	8,400

EMERGENCY FUNDS - Continued

Direct Allotments - Continued

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
II. Technical advice and assistance to State extension forces on agricultural adjustment programs.			
Advances to Agricultural Adjustment Administration			
1. Funds reimbursed for salary of extension employee paid by the Extension Service during the period of service with the Agricultural Adjustment Administration. .	$ 4,734	---	---
2. Combined commodity budget (cotton, wheat, tobacco, corn and hogs, sugar, peanuts and rice): For the employment of emergency agents, clerks, etc., and for travel expenses, telegraph, etc., necessary to conduct an educational campaign for the control of cotton, corn, tobacco, wheat, sugar, peanut and rice acreages, and in the production of hogs.	6,009,749	5,200,000	5,200,000
3. Compliance supervisors, supplies, etc. (cotton and tobacco): For the employment of compliance supervisors to measure acreage and other work incident to clearing certification forms in Cotton and Tobacco Adjustment programs, purchase of necessary measuring equipment, supplies, etc.	2,777,410	---	---
4. Tobacco committeemen: For the employment of committeemen to assist in contacting growers in connection with regular tobacco programs (cigar leaf and flue-cured).	18,680	84,350	84,350
5. Sugar committeemen (La.): For the employment of county and community committeemen to assist in contacting sugar producers in connection with the sugar acreage reduction campaign in Louisiana.	15,180	---	---
6. For the employment of committeemen and/or compliance supervisors for carrying out the plans of the sign-up campaign and the checking of farms for compliance in connection with the peanut production adjustment program.	360,000	175,000	175,000
7. For the employment of necessary field personnel to assist in contacting rice producers in connection with the rice acreage reduction campaign in Arkansas, Louisiana, Texas, and California.	72,500	70,000	70,000

EMERGENCY FUNDS - Continued

Direct Allotments - Continued

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
8. For supervision of the measurement of land planted to cotton under contract during 1935, the payment of supervisors, local supervisors, and clerical help incident to the measurement, computing areas, and completing compliance forms in connection with such contracts in order to carry out the provisions of the 1934-1935 cotton acreage reduction programs.	---	$ 2,500,600	$ 2,500,600
9. For the employment of tobacco appraisers in cigar-leaf producing States and supervisors in both the flue-cured and cigar-leaf tobacco producing States for compliance work in tobacco adjustment programs.	---	140,000	140,000
10. For the employment of field personnel to contact sugar cane producers in connection with the sugar cane for sirup program..	---	25,000	25,000
Total, Advances to Agricultural Adjustment Administration.	$9,258,253	8,194,950	8,194,950
III. Special assistance to State extension services in the administration of the Cotton Act of 1934.			
Administration of Cotton Act for 1934.			
1. Cotton taggers: For the employment of special employees to tag old cotton in connection with the Cotton Act of 1934 (Bankhead Act).	125,000	---	---
2. Cotton Act of 1934: For the employment of the field-service personnel required and all extra expense necessary to carry out the provisions of the Cotton Act for the crop year. .	8,959,395	3,537,500	3,537,500
Total, Administration of Cotton Act of 1934.	9,084,395	3,537,500	3,537,500

EMERGENCY FUNDS - Continued

Direct Allotments - Continued

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
IV. Special assistance to State extension services in the administration of the Kerr-Smith Tobacco Act.			
Advances to Department of Agriculture under Tobacco Act of June 28, 1934.			
For the employment of committeemen and/or clerks to assist in the administration of the Kerr-Smith Tobacco Act..	$ 151,000	$ 229,000	$ 229,000
V. Special assistance to State extension services on cattle purchase program for removal of surplus			
General Expenses, Agricultural Adjustment Administration			
To enable various State extension services to complete cattle purchase reports and related material required in connection with the 1934-1935 cattle purchase relief program which may not have been completed by June 30, 1935	- -	60,000	- - -
TOTAL, AGRICULTURAL ADJUSTMENT ADMINISTRATION FUNDS.	18,497,648	12,029,850	11,969,850
Loans and Relief in Stricken Agricultural Areas			
Technical advice and assistance to State extension forces in drought-relief programs, covering salaries and miscellaneous expenses incident to conducting educational work relating to relief in drought-stricken agricultural areas	1,900,000	---	---
TOTAL, EMERGENCY FUNDS (Direct Allotments)	20,397,648	12,029,850	11,969,850

WORK DONE UNDER AGRICULTURAL ADJUSTMENT ADMINISTRATION AND OTHER EMERGENCY FUNDS.

The Extension Service is cooperating with the Agricultural Adjustment Administration in carrying out the educational phases of the production control programs. Extension workers explain to farmers the purpose of the production control programs, the extent to which they affect producers, the agreements which it is proposed that farmers shall enter into, and similar points that may be helpful to producers in arriving at a conclusion as to whether or not they desire to cooperate. Extension workers organize the work in the various States, set up county and community committees, train these committeemen so that they are able to present the plan to other farmers, assist farmers in filling out and executing contracts and in all other ways make certain that every farmer has an opportunity to have a thorough understanding of the production control plans for the community in which he is interested. Extension workers also assist in the formulation and operation of county control associations, in the delivery of checks covering rental and benefit payments and similar matters, acting as a general field contact force for the Adjustment program.

In order that the Agricultural Adjustment Administration might have a trained local representative in every important agricultural county, it was necessary to supplement the existing force of county agricultural agents through the employment of approximately 1,000 emergency agents. As available Federal, State, and county funds were already fully utilized in financing the staff previously employed, the cost of these additional agents necessarily fell almost entirely on the Agricultural Adjustment Administration. State and county extension workers in all States in which important production control campaigns have been conducted have given practically their entire time to the adjustment work, including specialists in many lines not directly covered by adjustment programs, these specialists having been temporarily transformed into supervisors or otherwise engaged in production control activities.

On June 29, 1935, the Bankhead-Jones Act (U.S.C. title 5, secs. 511, 512; Act of June 29, 1935) became effective and the appropriation authorized ($8,000,000) was made available in the Second Deficiency Act, 1935. These funds will replace the greater part of funds heretofore made available by the Agricultural Adjustment Administration for the above-mentioned purposes. It is expected that certain phases of expense, such as cost of supervision of and actual measuring of acreages (compliance work) will be paid by the Agricultural Adjustment Administration, however, as heretofore.

A large item of expense in the production control campaigns is the employment of State, county, and community committeemen, compliance supervisors, and necessary clerical assistance, who present the control plans at local meetings or to individual farmers and who make the inspection of farms of contract signers to see that provisions of the contract are carried out. While payment to the county workers is nominal, being little more than the cost to them of operating their automobiles in traveling from farm to farm, the large number necessarily employed brings the total cost to a high figure. The payments to such county workers on the wheat, corn-hog, and certain of the tobacco

production control campaigns are made by deductions from benefit payments to the farmers in the county in which they serve, these payments being made by the County Production Control Association, and not by the Extension Service. The funds here under discussion represent the cost of the services of special employments in cotton, rice, and peanut campaigns and in certain of the tobacco control campaigns. At the request of the Agricultural Adjustment Administration, such payments are handled by the Extension Service.

For the fiscal year 1935, a special allotment was provided for the employment of special cotton assistants, State and county committeemen, and necessary clerical help required in the administration of the Cotton Act of 1934 in the several States in which Cotton is produced; also for the rental or purchase of equipment and supplies, the rental of office space, telephone, telegraph, freight, and express charges, and such other expenditures as might be necessary to carry out the purposes of the Act.

The remainder of funds transferred to the Extension Service provide for the employment of such additional extension workers as may be necessary to present the production control plans in all important agricultural counties, for the employment of clerical help in county agent offices to assist farmers in executing their contracts, for extra travel by State and county workers incident to the conduct of these campaigns, and all other expenses which are properly a part of the educational work.

In the spring and summer of 1934 large areas in Central, Western and Southern States were stricken with drought conditions and some measures toward relief by the Federal Government became necessary. Relief funds were allocated by the President to the Department and allocated by the Secretary of Agriculture to various bureaus designated to assist in this relief work. Funds for the extension phases of the drought work were administered prior to September 1, 1934 by the Agricultural Adjustment Administration, but effective that date, an allotment was made by the Secretary directly to the Extension Service in order that State extension forces might continue to assist in alleviating the effects of this disaster. Necessary transfers of personnel and other adjustments were immediately arranged between the Extension Service and the Agricultural Adjustment Administration, and the Extension Service during the period September 1, 1934 to June 30, 1935 administered the educational phases of the drought programs through extension directors of the States affected.

Extension workers dealt directly with farmers in connection with the details surrounding the purchase by the Federal Government of cattle in drought stricken areas and on matters relating to feed and seed distribution. State directors were authorized to employ necessary clerical help and incur miscellaneous expenses; in addition, the Extension Service appointed, wherever necessary, county drought directors at $1,800 per annum each, assistant county drought directors at $1,620 per annum each, and paid necessary traveling expenses of agents and supervising officials. Close cooperation was maintained with the Cattle Purchase and Commodity Purchase Sections of the Agricultural Adjustment Administration.

(h) MOTION PICTURES

Appropriation Act, 1936.	---
Allotment from "Farmers' cooperative demonstration work"	$79,000
Budget Estimate, 1937.	79,000 (1)

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Preparation of motion pictures.	$56,415	$70,360	$70,360
Distribution of motion pictures	7,681	8,640	8,640
Total obligations	64,096	79,000	79,000
Unobligated:			
Savings	878	---	---
Total	64,974	79,000	79,000 (1)

(1) The Budget estimate for 1937 includes a transfer of $79,000 by transfer from the appropriation "Farmers' cooperative demonstration work", which is reduced accordingly for 1937. To conform to the uniform project system of the Department, the motion picture work, which has been financed for many years under the appropriation for "Farmers' cooperative demonstration work", is set up as a separate activity.

WORK DONE UNDER THIS APPROPRIATION

General.--These funds meet the expenses incident to the maintenance of a motion-picture laboratory for the production of motion pictures as a means of disseminating information on the results of scientific research of the various bureaus of the Department and to teach improved methods and practices in agriculture, forestry, conservation, rural engineering, home economics, and kindred subjects. The continuation of this project is necessary.

Preparation of motion pictures.-- Under this project the actual productior costs of manufacturing motion pictures are provided. In cooperation with the various bureaus of the Department, scenarios and other details are worked out. Trained personnel is provided for making the necessary pictures and for development, processing, and other steps essential to the completion of the films. Travelling expenses incident to the actual photographic work and funds for the transportation of equipment are also provided under this project. This project is essential to the production of Departmental motion pictures.

Distribution of motion pictures.--Under this project funds are made available for the actual distribution of the completed films. Necessary personnel is provided in Washington, D. C., to maintain records and to distribute films. Notifications of release of films are prepared and catalogues and other necessary information furnished. Films are loaned to the 7,000 extension workers on request and to other educational agencies. The continuance of this project is essential to the efficient and effective motion-picture work.

(i) AGRICULTURAL EXHIBITS AT FAIRS

Appropriation Act, 1936.	$85,000
Budget Estimate, 1937	85,000

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Preparation of agricultural exhibits to be shown at fairs....	$35,059	$43,213	$43,213
Exhibition of agricultural exhibits at fairs.....	34,443	41,787	41,787
Total obligations.....	69,502	85,000	85,000
Unobligated:			
Savings.....	420	-	-
Total.....	69,922	85,000	85,000

WORK DONE UNDER THIS APPROPRIATION

General.--This appropriation item affords the means by which the Department provides the public with agricultural information in exhibit form which has come to be recognized as one of the important teaching methods. It also enables the Department, through the maintenance of a trained staff, to effectively coordinate the general exhibits work of its bureaus. The activity is carried on through a cooperative arrangement with State and interstate fairs within the United States by which the Department furnishes the exhibits and personnel for their management and demonstration, and the fairs pay a share of the cost of transporting exhibits, furnish exhibition space free, pay drayage and labor for unloading and reloading cars at exhibition points, common labor for unpacking, installing, dismantling, and repacking the exhibits, and janitor, watchman, electrical, and such other special services as are necessary to accomplish creditable display. The appropriation is used for projects as follows:

Preparation of agricultural exhibits to be shown at fairs.--Work under this project consists of the planning and preparing of agricultural exhibits, involving (a) investigations of materials and methods and principles useful in exhibit work; (b) an analysis of exhibit proposals, consultation with subject-matter specialists, determination of form of presentation, and preparation of

exhibit designs and building plans; and (c) construction and maintenance of exhibits, involving the development of mechanical appliances, electrical devices, art work, modeling, and lettering.

Exhibition of agricultural exhibits at fairs.--Work under this project consists of negotiating financial and cooperative agreements with fairs, Government departments and bureaus, railroads, associations, organizations, and other agencies for the movement, installation, display, and demonstration of educational exhibits at about seventy-five exhibitions each year, direction and management of such exhibitions, and the warehousing, shipment, return, and care of a vast number of educational exhibits.

(j) A CENTURY OF PROGRESS

(The Chicago World's Fair Centennial Celebration)
Transfer to Agriculture.

A transfer of funds of $21,839 for the fiscal year 1935 was made from the State Department to the Division of Exhibits, Extension Service, under the appropriation 3-04/4549 Chicago World's Fair Centennial Celebration (Transfer to Agriculture), Act of June 19, 1934.

This transfer was for the purpose of employing personnel, purchasing materials, and the making of contracts necessary in designing, preparing, assembling, transporting, installing, demonstrating, and arranging for the safekeeping of the Department's exhibits at a Century of Progress Exposition in Chicago and their return to the custody of the Department and restoration to such condition as to permit their use at subsequent expositions and fairs.

(k) CALIFORNIA PACIFIC INTERNATIONAL EXPOSITION

(Transfer to Agriculture)

12,899 7,102

A transfer of $20,000 was made for fiscal years 1935 and 1936 under appropriation 3-05/6352, California Pacific International Exposition (Transfer to Agriculture, Act March 21, 1935) 1935-1936, from General Appropriation, "Independent Office", to the Extension Service.

This appropriation was for the purpose of employing personnel, purchasing materials, and the making of contracts necessary in designing, preparing, and assembling educational exhibits, portraying activities of the Department of Agriculture, and installing, demonstrating, and maintaining these exhibits at the California Pacific International Exposition, San Diego, California, and for their return to the custody of the Department and restoration to such condition as to permit their use at subsequent occasions.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
Agricultural Adjustment Administration (Salaries and Expenses):			
For preparation of exhibits in connection with agricultural adjustment programs, including the employment and necessary expenses of personnel engaged in the field and the preparation and display of special exhibits to present the A.A.A. program for farm crop and livestock production under the farm management principles advocated by the Administration at State, interstate, and other fairs, meetings, etc., during the exhibition season.....	$10,000	- - -	- - -
Emergency Relief Appropriation Act of 1935:			
For renovating and rebuilding agricultural exhibits, including the employment and necessary expenses of personnel engaged in discarding, dismantling, and reducing to utilizable material Department of Agriculture exhibits that have served their usefulness, renovating, revising, and rebuilding exhibits that still contain useful information; classifying, listing, and describing complete exhibits and salvaged materials; rearrangement of exhibits and salvaged materials in the warehouse to create more space to facilitate construction work and shipments and the erection of certain partitions to improve working conditions.....	- - -	$ 4,066	- - -
Total Emergency Funds (Direct Allotments).	10,000	4,066	- - -

(1) COOPERATIVE FARM FORESTRY

Appropriation Act, 1936. . . . . $ 56,838
Budget Estimate, 1937. 56,838

PROJECT STATEMENT

Projects	1935	1936 Estimated	1937 Estimated
Obligated:			
Technical advice and assistance in farm forestry to State Extension forces.	$ 5,291	$ 6,298	$ 6,298
Allotments to States for cooperative farm forestry	44,082	50,540	50,540
Total obligations	49,373	56,838	56,838
Unobligated:			
Savings	5,167	-	-
Total.	54,540	56,838	56,838

WORK DONE UNDER THIS APPROPRIATION

General.--Section 5 of the Clarke-McNary Forestry Act of June 7, 1924 authorizes an annual appropriation of $100,000 for the promotion of educational work with farm people in establishing, improving, and renewing wood lots, shelterbelts, windbreaks, and other valuable forest growth and in growing and renewing useful timber crops. Part of this appropriation may be used in Washington for administration and the remainder is allotted to the States and Territories in such amounts as the Secretary of Agriculture may determine upon or as may be agreed upon with the States, provided the States expend an equal amount for a like purpose. The project in the States usually is made in cooperation with the State forestry department but is administered by the State agricultural extension director of the land-grant college as a definite part of the cooperative agricultural extension system of each such institution. This appropriation is, therefore, a very necessary and vital part of the cooperative agricultural extension system, and its continuance is necessary to the proper conduct of this important phase of the Department's work.

Technical advice and assistance in farm forestry to State extension forces.--This project covers the cost of the employment of one extension forester specialist in Washington, as part of this appropriation may be used for administration in Washington. His services are very essential to the coordination of all extension

activities in farm forestry in the field. He cooperates with the Federal Forest Service and is responsible to that service for the information on all phases of forestry which he carries to the States and to the Federal Extension Service for his contacts with extension forces in the field. The extension forester assists the State extension services to incorporate the practical results of the research findings of the Federal Department in their State extension forestry programs and carries information in improved forestry and gathers information as he travels from State to State. This specialist also prepares forestry extension literature, makes talks and radio addresses, and otherwise promotes better forestry practices.

Allotments to States for cooperative farm forestry.--Under this project funds are used for cooperation with the States in the employment of extension foresters. The usual arrangement is for the Federal Government to contribute toward the salary of the extension forester, the State providing for the remainder of his salary, State travel expenses, clerical help, and other necessary expenses. Usually the State contribution is considerably more than that of the Federal Government. At present this cooperative arrangement is in effect with 34 States and Puerto Rico. A very large part of the farm acreage of the United States is in woodland and much of the income of the farmers in certain sections, particularly the Northeastern and Southern States, is from forest products. County agents generally are not trained in forest management and need the assistance of farm forestry specialists in strengthening their work in this field. The extension forester arranges demonstrations in woodlot management, selection of trees for cutting, estimating of merchantable timber, and in other fields. In many States the extension forester is also active in assisting farmers in forest planting plans and in interesting members of boys' and girls' clubs in tree planting.

(m) COOPERATIVE AGRICULTURAL EXTENSION WORK
(Permanent Annual Smith-Lever Appropriation)

Appropriation, 1936.	$4,686,096
Estimate 1937.	4,696,096
Increase.	10,000

PROJECT STATEMENT

Projects	1935	1936 Estimated	1937 Estimated	Increase
Payments to States, Hawaii, and Puerto Rico for cooperative agricultural extension work (Smith-Lever Act).	$4,676,096	$4,686,096	$ 4,696,096	$10,000

The increase of $10,000 for 1937 is the annual increment for Puerto Rico authorized by the Act of March 4, 1931, extending the benefits of the Smith-Lever Act to Puerto Rico.

WORK DONE UNDER THIS APPROPRIATION

This is the permanent annual appropriation for cooperative extension work provided in the Smith-Lever Act of May 8, 1914, as amended by the extension of this Act to the Territory of Hawaii by the Act of May 16, 1928 and to Puerto Rico by the Act of March 4, 1931. Under the provisions of these Acts, $10,000 is appropriated annually to each State, Hawaii, and Puerto Rico without requirements of State or Territorial offset. In addition to the States, Hawaii and Puerto Rico share in the remainder of the annual appropriation in the ratio which the rural population of each bears to the total rural population of the United States, Hawaii, and Puerto Rico. This is the basic act under which cooperative extension work is conducted by the Department and the State colleges of agriculture.

The maximum Federal appropriation authorized by the Act of March 4, 1931, extending the benefits of the basic permanent annual Smith-Lever Act of May 8, 1914 to the Territory of Puerto Rico, is $95,069.09, which will be reached during the fiscal year 1938.

EMERGENCY FUNDS - BUREAU TOTAL

(Direct Allotments)

Summary

Projects	Obligated 1935	Estimated Obligations 1936	Estimated Obligations 1937
Agricultural Adjustment Administration Funds:			
Salaries and Expenses (Technical assistance to Extension Service (Washington office) on agricultural Adjustment programs).....	$ 4,000	$ 8,400	$ 8,400
Salaries and Expenses (Preparation of exhibits in connection with agricultural adjustment programs).....	10,000	---	---
Advances to Agricultural Adjustment Administration (Technical advice and assistance to State extension forces on agricultural adjustment programs).....	9,258,253	8,194,950	8,194,950
Administration of Cotton Act of 1934 (Special assistance to State extension services in the administration of the Cotton Act of 1934)....	9,084,395	3,537,500	3,537,500
Advances under Tobacco Act, (Special Assistance to State extension services in the administration of the Kerr-Smith Tobacco Act).....	151,000	229,000	229,000
General Expenses (Special assistance to State extension services on cattle purchase program for removal of surplus).....	---	60,000	---
Loans and Relief in Stricken Agricultural Areas (Technical advice and assistance to State extension forces in drought relief programs)..	1,900,000	---	---
Emergency Relief Appropriation Act of 1935 (Repairs, modernization and improvement) of agricultural exhibits).....	---	4,066	---
Total, Emergency Funds.....	20,407,648	12,033,916	11,969,850

WEATHER BUREAU

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1936		$124,840
Allotments from		
"General weather service and research".	$ 3,300	
"Aerology"	10,140	+13,440
Total Available, 1936		138,280
Budget Estimate, 1937		138,280 (1)

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
General administration and business service	133,050	138,280	138,280
Unobligated:			
Savings	677	---	---
Total	133,727	138,280	138,280

(1) An increase of $13,440 when compared with appropriation for 1936 but no change when compared with amount available for 1936, since the Budget estimate provides for the transfer of certain administrative and service positions now carried under the appropriations for "General weather service and research" and "aerology", in which there are corresponding reductions ($13,440) for 1937.

WORK DONE UNDER THIS APPROPRIATION

General administration and business service.-- General administration of the Bureau is centralized in Washington, D. C., and this appropriation is for the maintenance of fiscal and administrative units, including offices concerned in matters of personnel, accounting, contracts, files, and property.

(b) GENERAL WEATHER SERVICE AND RESEARCH

Appropriation Act, 1936	$2,040,968
Transferred from:	
"Meteorological Station, Western Montana"	+ 10,000
"Horticultural Protection".	+ 49,467
Less:	
Allotment to "General Administrative Expenses"	- 3,300
Total available, 1936	2,097,135
Budget Estimate, 1937	2,227,155
Increase	130,020 (1)

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
Meteorological service:				
General forecast and warning service	$672,608	$699,668	$757,268	+$57,600(2
Climatological service	531,895	551,000	560,000	+ 9,000(3
Hurricane and storm warning service	116,360	200,000	200,000	- -
River and flood service	193,945	200,000	225,000	+ 25,000(4
Forest fire-weather service	40,475	42,000	77,000	+ 35,000(5
Agricultural meteorological service	137,644	142,000	142,000	- -
Marine service	85,285	88,000	88,000	- -
Horticultural protection service	27,133	43,467	43,467	- -
Total, Meteorological service	1,805,345	1,966,135	2,092,735	+126,600
Meteorological research:				
Meteorological physics	17,923	18,570	18,570	- -
Forecast improvement investigations	33,908	35,000	38,420	+ 3,420(6)
Hurricane investigations	12,110	12,500	12,500	- -
River and flood investigations	9,688	10,000	10,000	- -
Forest fire-weather investigations	3,875	3,930	3,930	- -
Agricultural meteorological investigations	9,688	10,000	10,000	- -
Climatological investigations	27,126	28,000	28,000	- -
Marine meteorological investigations	6,782	7,000	7,000	- -
Horticultural protection investigations	5,800	6,000	6,000	- -
Total, Meteorological research	126,900	131,000	134,420	+ 3,420
Total obligations	1,932,245	2,097,135	2,227,155	+130,020(1)
Unobligated:				
Savings	1,007	- -	- -	- -
Total	1,933,252	2,097,135	2,227,155	+130,020(1)

(1) The increase of $130,020 for 1937 is on the basis of a total available appropriation of $2,097,135 for 1936 (which provides for the transfer of $10,000 from "Meteorological Station, Western Montana", and $49,467 from "Horticultural Protection", and an allotment of $3,300 to the item "General Administrative Expenses"). The $130,020 increase includes:

(2) An increase of $57,600 in the project "General Forecast and Warning Service". This will make provision for an indispensable emergent need. Although the forecast and warning work conducted under this project is among the most essential activities for which the Weather Bureau is directly responsible to the people of the Nation, it has been impossible, because of economies since 1933, to maintain the adequate forecast service necessary to properly safeguard life and property. Forecast and warning message distribution is far below a minimum of adequacy and should be returned to more normal requirements. The numerous field headquarters carrying on this important work require rehabilitation, particularly in regard to instrumentation and office facilities. Only the barest necessities can be furnished by these additional funds.

(3) An increase of $9,000 in the project "Climatological Service," to provide for inspection and needed improvement of climatological cooperative equipment. The cooperative climatological service of the Bureau is unique in utilizing the observations and reports of over 4,000 cooperatives who work, often over long periods of years, without pay. The successful operation of this service depends mainly upon regular personal contact with supervisory officials. The interest of the cooperatives in their work is best maintained by personal relationships established through frequent inspections. These inspections have, as a rule, because of economy measures, been postponed in the last several years beyond reasonable periods. Equipment at many of the cooperative stations is now in poor condition and rehabilitation is imperative.

(4) An increase of $25,000 in the project "River and Flood Service". In the floods of the Mississippi basin and elsewhere, the Weather Bureau has saved through its warnings numerous lives and property worth millions of dollars. This branch of the Bureau work requires material strengthening, however, to enable it effectively to meet the ever increasing needs incident to the development of large engineering projects and to other changes in the industrial development of the country. The demands for river-stage forecasts and flood warnings have increased. Some regions subject to river floods are not covered by Weather Bureau service and those regions which are covered should be given a more intensive service to the end of still further reducing flood losses. The artificial changes that are being made in an engineering way in the floodplains of most of the rivers also require a revision of the entire flood forecasting plan to enable the Bureau to provide the service it has been able to render in the past. Strengthening of the service is required to enable some personnel to devote full time to the necessary revision and use of the flood forecasting formulas and, in addition, permit of extension and improvement of the mountain snowfall work conducted under this project. The need for mountain snowfall measurements and water runoff estimates made from these measurements has increased beyond the present facilities of the Weather Bureau, which is called upon to furnish information to the operators of the numerous reservoirs in the West, both to enable them to know approximately how much water will be available for power, domestic use, irrigation, etc., and to prepare for floods. The Bureau is also dependent upon a full knowledge of the amount and condition of the mountain snow in making flood forecasts for western rivers, such as the Sacramento in California and the Columbia in Washington and

Oregon. More detailed, comprehensive evaporation data than now available must be provided to agriculture and to engineers of western reservoirs where evaporation losses are very great.

(5) An increase of $35,000 in the project "Forest Fire-Weather Warning Service." There is urgent need for improving and materially strengthening the fire-weather warning service. At the present time the organization is a skeletonized one. It is impossible to meet the justifiable demands of the agencies of the government (Forest Service) and State and private owners engaged in the protection of forests for weather information, especially localized forecasts of conditions favorable to the inception and spread of forest fires.

The fire-weather warning service is conducted in seven districts, each district consisting of from one to several States. Only one meteorologist is on duty in each district. This does not permit proper inspection of substations, compilation and arrangement of records in a form to enable the forecaster to localize and amplify the forecasts, or to provide needed service in other directions.

Experiments conducted in California for four years with a truck and radio equipment loaned by the Forest Service have abundantly demonstrated that in many cases far more efficiency is obtained by the forecaster's proceeding to the region of large fires and giving to the fire fighters first-hand and frequent advices concerning weather conditions which may increase or minimize the danger of fire spread. The value of such service in fire protection operations is great.

It is the Bureau's purpose to equip each district with a truck unit and necessary personnel as soon as practicable. The increase under consideration will permit truck units being placed in the three districts where they are most needed. Each truck will be equipped with meteorological instruments and radio receiving and sending apparatus, thereby enabling the meteorologist in charge, while at the locality of a fire, to obtain weather reports, prepare charts, and issue forecasts and information to other sections. The trucks also will be used to inspect sub-stations and to transport instrumental equipment thereto.

(6) An increase of $3,420 in the project "Forecast Improvement Investigations". The present staff of the Weather Bureau library, probably the largest meteorological library in the world, is so small that it is with difficulty that it can perform even the most necessary routine work of accessioning, cataloging, binding, maintaining loan and periodical records, supervising station libraries, and translating correspondence. The proper functioning of the library as an aid to the research workers of the Bureau through the preparation of bibliographies and through reference work is of first importance. Much of the time of the librarian and first assistant could be released for these purposes if additional personnel were available for carrying on the ordinary functions of library service.

CHANGE IN LANGUAGE

The word "Printing" has been inserted after the word "Government" to correct an error in the 1936 text.

WORK DONE UNDER THIS APPROPRIATION

General.--This appropriation provides for the conduct of most of the major service activities of the Weather Bureau essential to the maintenance of nation-wide meteorological activities serving agriculture, commerce, and many other special interests, as well as the general public. Basically, the work consists of the collection and dissemination of meteorological data and of the issuance and distribution of weather forecasts, warnings, and advices. The advisory and warning services, including those in connection with occurrence of storms, hurricanes, cold waves, frosts, fire-weather conditions, and floods, are fundamental purposes set forth in the organic act creating the Weather Bureau.

General Forecast and Warning Service.--The preparation and dissemination of weather forecasts and warnings constitute a fundamental activity of the Bureau for which purpose Congress originally authorized a Federal weather service in 1870. Under this project the Bureau is required to take, record, encipher, telegraph, and compile regular meteorological observations; to issue general and local weather forecasts daily, including frost, cold wave, and other special warnings and forecasts when injurious weather and temperature conditions are expected; and to disseminate weather forecasts, warnings, and synopses by telephone and telegraph, by printed bulletins, maps, and by forecast cards, and through cooperation with the newspapers, radio broadcasting stations, and other available means, for the benefit of agriculture, commerce, and navigation in all parts of the United States and in adjacent ocean areas. Synoptic weather observations are collected by telegraph and entered on skeleton maps. The forecasters, from experience in dealing with many weather maps and a knowledge of the physical processes involved, are able to predict with accuracy the weather changes that will ensue. The forecasts and warnings so prepared are promptly and widely disseminated.

Climatological Service.--This service was established by an Act of Congress (U.S.C., title 15, secs. 311-313, 317), effective July 1, 1891, which charged the Weather Bureau with collecting meteorological data sufficient to establish the climatological characteristics of the United States. The work covers the collection and publication of climatological data for all parts of the United States, including the preparation of maps to show normal climatic conditions in different sections of the country. It involves the maintenance of 4,500 cooperative and other meteorological stations, for which daily, monthly, and annual reports of temperature, precipitation, etc., are compiled and published. There are published 42 separate monthly and annual reports, and data for the entire country are published annually in the Report of the Chief of the Weather Bureau. Summarizations are issued in Bulletin W for all past years of record.

Hurricane and Storm Warning Service.--Issue of storm warnings for the Great Lakes was authorized by Congress in 1870. The service has since been extended to the Atlantic, Pacific and Gulf coasts, and use of radio on shipboard has resulted in extension of the service to ships at sea. The Bureau must locate and follow storms, including those of tropical origin (hurricanes) by means of synoptic observations assembled on weather charts; furnish information as to the location, intensity, and probable movement of storms; and issue warnings of their approach (including prediction of dangerous winds and tides which sometimes attend them) for the benefit of mariners and residents of seacoast and lakeshore sections. Observations are collected by radio and cable from West Indian stations and from ships at sea to supplement the regular collection for general forecast purposes.

Advices and warnings are disseminated by telegraph, telephone, and radio from district forecast centers. Warnings are displayed by means of flags and lanterns at 259 local display stations, which are maintained under the supervision of 53 storm-warning centers.

River and Flood Service.--Service was organized in 1870 by the installation of a few river and rain gages. The growth of the service has been gradual and the organization now consists of approximately 700 river-gage stations, 300 rainfall, 84 snowfall, and about 50 evaporation stations. The country is divided, for the purposes of administration and forecasting, into 71 districts, each having a central office, the whole being under the administrative control of the River and Flood Division. The river stages read daily are published annually in one volume. The primary object of the service is the making of river-stage and flood forecasts for the protection of human lives and for the benefit of agriculture, navigation, engineering interests, and all users of river water. The flood forecasts are of general use and benefit throughout the river valleys. The river-stage forecasts made from day to day are of vital importance to navigation interests and construction work in progress along rivers. Snowfall measurements in mountains are made for determining the effect of melting snows on streams. Evaporation measurements are to determine water losses, particularly in semi-arid regions. The stage publication is used principally by agriculturists, engineers, and navigators. River-stage, rain, snowfall, and evaporation observations are collected in the district offices, where they are charted, and whence the necessary forecasts and warnings and other reports are issued. The stage publication is prepared and printed in Washington.

Forest Fire-Weather Service.--Fire-weather warnings were first issued in 1916 as a regular service from district forecast centers. Since that time several independent fire-weather districts have been organized with specialists assigned to the work. Seven separate districts are now maintained. This work requires the collection and compilation of meteorological data from forested areas to ascertain the influence of current weather conditions on the frequency and spread of fires and the issue of special forecasts and warnings as an aid to Federal, State, and local agencies engaged in controlling and suppressing fires in the forests of the United States. Observations are taken two or three times daily at special stations in the forests during the fire season. The data are communicated by telegraph or telephone to the fire-weather district centers to supplement the reports collected for general purposes. The information is charted and specialized forecasts and warnings are disseminated. The fire-fighting forces are augmented, deployed, or concentrated in accordance with the probable fire hazard as indicated by the fire-weather forecaster.

Agricultural Meteorological Service.--In 1872 the Signal Service of the War Department published the first weather bulletin in this country, containing a summary of weather as affecting agriculture. This was finally developed into what are now known as Corn and Wheat and Cotton Region Bulletins, and Weekly Weather and Crop Bulletins, published at Washington and certain field stations. This project provides for the collection and publication of data relating to current weather conditions and their effect on crop growth and agricultural operations in general. Publication of the data and determination of their effect on crop growth and farm work are based largely on reports from numerous weather observers and weather and crop correspondents in all sections of the United States and on known relations of weather to crops, established during investigations of the relationship to crop yields.

Marine Meteorological Service.--Work in ocean meteorological service has been conducted by the government for almost a century. The Navy and (successively) the Army and the Weather Bureau have maintained individually or cooperatively the continuity of this activity since 1844. The Weather Bureau is now specifically designated by law (U.S.C., Supp. 7, title 5, Sec. 458a) to conduct the major lines of work in ocean meteorology and to furnish meteorological information published on the Pilot Charts issued by the Hydrographic Office of the Navy. The primary objects of the project are the maintenance and improvement of ocean weather observations and reports through an extensive program organized for rapidly collecting, charting, and summarizing the reports to provide maritime commerce with accurate, properly digested meteorological information and at the same time to secure data for basic studies of weather conditions and storms affecting the continental United States and the adjacent oceans. Daily weather observations at sea are taken and reported in prescribed form by ships' officers using (in the main) meteorological instruments that are regularly a part of a ship's instrumental equipment. Contacts with the observing officers and supervision of the meteorological instruments are largely accomplished through 30 field offices of the Weather Bureau located at major ports of the United States and its island possessions.

Horticultural Protection Service.--With the advent of systematic practice of protecting orchards and truck gardens from frost, specialized local forecasts, as an aid in protecting operations, became necessary. The special Horticultural Protection Service of the Weather Bureau began in 1917. The work consists of specialized local forecasts for the use of fruit and truck growers in their frost-protection work; also advice as to best methods of protection. The forecasts are made from synoptic weather charts and current local observations, including hydrometric formulae applicable to the particular locality.

Meteorological Physics.--A knowledge of the physical processes that occur in the atmosphere is basic to an efficient meteorological service. Studies along this line have been made in the past with important results, but they are even more necessary and valuable now in view of the more abundant and more accurate data available on land, at sea, and in the air and the increasing use of the knowledge of physical processes in all practical applications of meteorology. The object of the work is to gain a wider and more accurate knowledge of the structure of the atmosphere and a fuller understanding of all that occurs in it, including solar radiation, its amount and properties, and its action within the atmosphere. One or more technical problems are kept under specific study and investigation at all times. The current literature on technical subjects relating to meteorology is read and digested in order to keep fully informed of every new development that contributes to our knowledge of the subject. Continual contact is maintained with others conducting scientific research in similar fields of endeavor.

Forecast Improvement Investigations.--Studies for the purpose of improving the accuracy and extending the period of weather forecasts have been carried on currently since the establishment of the Weather Bureau. Such studies have resulted in many betterments of service. A continuation of such studies is necessary for further improvement. The work covers investigations of the causes of weather changes, in order that the physical basis of the changes may be better understood; the formulation of rules and principles for the guidance of the forecaster; and the development of means for making forecasts of a reliable character for periods of a month or more in advance, for the benefit of

agricultural and other interests. Investigations are carried on as a regular program at six district forecast centers where the forecasters alternate monthly between active duty and study. Similar researches are conducted at other field stations. Intensive studies of this character, including air mass analysis methods, are prosecuted at the central office in Washington. Files of daily weather maps and the meteorological records, both surface and upper air, of past months, seasons, and years form the basis of statistical and other special studies.

Hurricane Investigations.--Investigations of hurricanes by the Weather Bureau date back nearly half a century. Development and utilization of the knowledge of hurricane characteristics and movements was stimulated by the invention and growth of radio communication in the first quarter of the present century. As a result, much additional information is now available as a basis for the investigations. Fully developed hurricanes are attended by winds dangerous to ships at sea and destructive to life and property in coastal sections. Some are accompanied by inundations which cause great loss of life and property. A better understanding of the causes of hurricane genesis and movement is needed in the issue of warnings of greater detail and accuracy. Earlier warnings are needed for taking precautions to save lives of persons in exposed places and to protect property in the threatened areas. All available observations from ships at sea and island and coastal stations, including detailed reports secured by mail, are charted for study of each hurricane. The studies concern the movement of hurricanes in relation to kind, amount, and movement of clouds; wind directions and speed at the surface and from pilot balloon observations of the upper air; direction, period, and amplitude of sea swells which precede the hurricane; tides along the coast in advance of the storm center; and the general pressure distribution.

River and Flood Investigations.--This work consists of investigations of the relation of precipitation to both ordinary flow and flood flow in streams; and losses by evaporation from water that is to be used consumptively, industrially, or for navigation. The present empirical methods of estimating stream flow and water losses are unsatisfactory and should be replaced by formulae evolved from improved data now becoming available through the use of recording gages. It is proposed to construct volumetric or discharge formulae for forecasting river stages and floods, to study the effect on stream flow of accumulated snow in mountains, and to determine as nearly as possible the water losses by evaporation.

Forest Fire-Weather Investigations.--Forest fires cause great economic losses. In some years losses run into hundreds of millions of dollars. One of the functions of the Weather Bureau is to determine the exact relationships between meteorological conditions and the inception and spread of fires. Intensive investigations of this character were instituted in 1924. The studies conducted under this project result in obtaining more precise information as to the relation of meteorological conditions to fire hazard, particularly localized conditions in areas with varied topography. The results of statistical and other studies are used to improve the fire-weather warning service. Daily observations are compiled by decades, months, and seasons, and the extremes and averages of conditions are correlated with fire occurrences. Intensive studies of weather conditions in relation to the occurrence of lightning storms without precipitation are carried on because of the large number of fires caused thereby.

Agricultural Meteorological Investigations.--For many years there have been more or less systematically conducted investigations of the effect of weather on crops. Results of the first extensive investigations of the Weather Bureau in this field are contained in Weather Bureau Bulletin No. 36, "Relations Between

Climates and Crops", by Cleveland Abbe, in 1905. Since then considerable investigational work has been done and the results published. Investigations are made to determine the relation between weather and crops, especially optimum weather conditions for different crops, as an aid, among other things, in determining the areas best suited, from the climatic standpoint, for various crops. Up to the present time the work has been carried on principally through mathematical correlations of temperature, sunshine, precipitation, relative humidity, and other weather phases to crop yields.

Climatological Investigations.--When sufficient meteorological records became available, for some stations as early as 1870, investigations were begun to determine the climatic characteristics of different sections of the United States, and work of this character has continued up to the present time, becoming more dependable as the length of the records increased. Also from time to time various climatic charts have been prepared and revised as additional data became available. Studies are made to determine the climatic features of the United States and, incidentally, in a meager way, of foreign countries. Climate is a determining factor in economic land use, and for best results in agriculture, in general, and for specific use of land for certain crops it is necessary to have dependable information as to the normal climate. Summarizing, studying, charting, and comparing weather records of different sections for long periods of time and the preparation of normal charts for different climatic elements showing geographic distribution of comparable conditions are conducted under this project; also special studies, such as climatic trends, for different areas.

Marine Meteorological Investigations.--The study of winds and storms at sea constituted one of the earliest phases of meteorological research because of the extreme importance of ocean weather to transport by sail, and this interest on the part of navigators has continued to the present time. The development of air navigation over the sea now calls for extensive surveys of data from a new point of view. Present-day needs also require research into atmospheric conditions over the oceans, inasmuch as it is now understood that the major energy supplies of the atmosphere are large derived from the ocean surface. Research in marine meteorology, therefore, has the following objectives: (1) Continual revision and improvement of the data required by law to be furnished for publications on the Pilot Charts of the Hydrographic Office for benefit of maritime commerce. (2) Extraction of data from the accumulated records for application to modern problems of ocean transport, including air navigation, air-conditioning and refrigerating of ships, and determination of climatic influences on cargoes moving on routes that encounter a wide variety of weather conditions within the term of a single passage. (3) Investigation into the energy relations subsisting between the ocean surface and the overlying atmosphere, to secure data useful for studies of air mass analyses and for possible application to problems of extension in range of weather forecasts. Research is being advanced by development of punch-card methods of statistical analysis; by application of mathematical correlation methods to evaluate the importance of diverse factors of relation between ocean and atmosphere; and by steady increase in properly digested summaries of ocean weather data.

Horticultural Protection Investigations.--For specialized local frost forecasting for the protection of fruit and vegetables, basic data applicable to the specific localities were necessary, and investigational work to obtain these began in 1917. Various forecasting formulae, etc., have been improved from time to time as longer records became available. Studies are made to determine the relative

susceptibility to frost of different localities having varying topographic features, and meteorological data are collected for the preparation of hygrometric formulae as an aid in local forecasting. Investigations are also conducted as to the most effective and economical method of protecting fruit and vegetable crops from frost damage. Establishment and maintenance of a number of meteorological stations representing different topographic and other conditions is required to determine temperature and humidity relations in different localities.

(c) METEOROLOGICAL STATION, WESTERN MONTANA

Appropriation Act, 1936	$10,000
Budget, 1937	- - -
Decrease	10,000(a)

(a) This is merely an apparent reduction, as the item has been transferred to and merged with the appropriation "General Weather Service and Research".

(d) HORTICULTURAL PROTECTION

Appropriation Act, 1936	$49,467
Budget, 1937	- - -
Decrease	49,467(a)

(a) Apparent reduction only; funds transferred to and merged with "General Weather Service and Research".

(e) AEROLOGY

Appropriation Act, 1936	$1,213,929
Less allotment to "General Administrative Expenses"	- 10,140
Total Available, 1936	1,203,789
Budget Estimate, 1937	1,544,389
Increase	340,600(1)

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
Commercial Airway Meteorological Service.....	$ 931,268	$1,000,482	$1,289,082	+ $ 288,600 (2)
Upper Air Soundings.....	153,283	158,307	210,307	+ 52,000 (3)
Total, Aerological Service.....	1,084,551	1,158,789	1,499,389	+ 340,600
Commercial Airway Forecast Investigations....	4,740	5,000	5,000	- -
Upper Air Surveys and Investigations.....	37,960	40,000	40,000	- -
Total, Aerological Research.....	42,700	45,000	45,000	- -
Total obligations	1,127,251	1,203,789	1,544,389	+ 340,600 (1)
Unobligated:				
Savings.....	2,533	- -	- -	- -
Total.....	1,129,784	1,203,789	1,544,389	+ 340,600 (1)

(1) The increase of $340,600 for 1937 is on the basis of a total available appropriation of $1,203,789 for 1936 (which provides for an allotment of $10,140 to the item "General Administrative Expenses"). The $340,600 increase includes:

(2) An increase of $288,600 in the project "Commercial Airway Meteorological Service", to provide an essential improvement of Federal airway meteorological service through establishment of an adequate network of reporting stations. The Weather Bureau airway service is in a precarious state due to the fact that appropriations for "Aerology" have been reduced more than $300,000 during a period when the Federal airways were expanded 28 percent and the passenger-miles flown by air-transport operators increased enormously. A much denser network of weather reporting stations must be provided before accurate and timely warnings of impending weather changes six to eight hours in advance can be given. A large number of additional stations will be needed to fill in the "holes" on the map where weather hazards now approach airways without warning. Further essential service is required through the establishment of "on call" airway stations and provision for "clearance" weather reports at "on call" stations for determination of weather "trend". The present limited appropriations provide only one weather report to be received from stations on 19,000 miles of airways for clearance of each passenger-carrying aircraft. The arrangement provides no means for establishing the "trend" of the weather prior to departure. This is a situation to be deplored, inasmuch as many of these airways have relatively heavy traffic, the weather service for which, however, is very poor owing to absence of reports. With lives and property at stake, the situation must be corrected. It is proposed to do this by providing for two "clearance" weather reports from present "on call" stations and establish fifty additional "on call" stations on the airways.

(3) An increase of $52,000 in the project "Upper Air Soundings". At the present time the distribution of airplane observation stations is entirely inadequate. Additional stations are required to accurately identify and determine the structure above the earth's surface of various polar and tropical air masses, along whose boundary surfaces or "fronts" most of the weather phenomena occur. This increase provides for four such additional stations at the present time. By means of airplane observations the top of cloud layers, the vertical extent of icing conditions, and other important upper-air conditions are determined for the safe and efficient operation of aircraft through and over the top of cloud masses. Criteria for air-mass identification which are taken from surface observations are notoriously unreliable especially in the neighborhood of mountains. Many times, marked changes in temperature and moisture occurring aloft, with little or no change in surface observations, are of great importance in subsequent weather developments. In these cases, then, it is only from airplane soundings that the forecaster and aircraft operators are aware of important changes occurring in the weather pattern aloft. As for the important question of determining the vertical extent and the thermal and moisture structure of the air masses, surface observations give practically no clue. It is here that airplane soundings are indispensable. The most useful and graphical method of showing the various air masses and their structure is in the construction of vertical cross-sections through the atmosphere along certain lines going through a number of airplane stations. The work now being done with the meager data at hand has resulted in the recognition that the cross-sections aid in the understanding of weather phenomena along physical principles and will enable forecasts to be made following more nearly physical lines of reasoning than was heretofore possible. The number of stations should provide for at least three east-west and four north-south sections, with the distance between the stations to be not more than three hundred miles. With such a network, it would be possible to identify the air masses and their structure, including location of their frontal surfaces.

WORK DONE UNDER THIS APPROPRIATION

General. As a consequence of the provisions of the Air Commerce Act of 1926, meteorological information and flying weather forecasts are furnished to pilots on all airways designated by the Secretary of Commerce as routes suitable for air commerce. In addition, investigation and study and general weather forecasting of the upper air in the interest of air navigation are conducted under this appropriation.

Commercial Airway Meteorological Service.--Intensive weather service for air navigation was inaugurated by the Weather Bureau soon after passage of the Air Commerce Act in May, 1926. At the close of 1926 the transcontinental airway was the only one on which flights were being made both day and night. Since that time the airway weather service has expanded with increased number of Federal airways. In 1936 there were approximately 13,000 miles of airways over which 24-hour weather service was maintained and approximately 19,000 miles over which service was maintained on a less than 24-hour basis. The airway weather service is maintained to provide the maximum amount of safety possible in air navigation so far as weather is concerned. Specific and accurate weather information is essential in air travel, particularly as regards ceiling heights and visibility. The airway weather service consists primarily of hourly reports from stations on the airways and 6-hourly reports from off-airway stations. These are collected at 10 designated centers where they are charted and aviation forecasts and summaries prepared. These forecasts and summaries are promptly distributed over the

airways network, chiefly by means of teletype and radio, with special advices at 3-hourly intervals whenever important weather changes justify.

Upper-Air Soundings.--Observations in the upper air were begun in 1898 by the use of kites and captive balloons. Airplane observations began to displace kites and captive balloons in 1931 and wholly supplanted them in 1933. In July, 1934 the Weather Bureau operated 6 airplane observation stations by contracting with commercial flyers and the War and Navy Departments made airplane observations at approximately an equal number of stations each. Pilot balloon observations were inaugurated by the Weather Bureau in 1918, with the number of stations gradually increasing to some 70 in 1935. Airplane and pilot balloon observations are essential in both general and airway forecasting and in identifying air masses. Sounding balloon observations provide the same data as both airplane and pilot balloon observations but to much greater heights. The records, however, are not available for current use as the meteorograph usually lands at a considerable distance from the stations. Airplane observations are made daily to heights of 17,000 feet and free-air temperatures, pressures, and humidities obtained. Pilot balloon observations are made from 2 to 4 times daily, and free-air wind directions and velocities at various elevations are obtained. These data are furnished to local flying interests and promptly transmitted to the various forecast centers. The computed records are forwarded to the central office of the Weather Bureau at Washington, where they are summarized and used in special studies and investigations. Monthly free-air temperatures and relative humidities for each station and monthly free-air wind resultants for a selected number of key stations are published regularly in the Monthly Weather Review. Sounding balloon observations are made at only one or a relatively few stations in connection with special investigations of particular weather conditions and during international programs.

Commercial Airway Forecast Investigations.--With the accumulation of observational data obtained since the inauguration of intensive airway weather service subsequent to the passage of the Air Commerce Act of 1926, studies have been made with a particular view toward determining average flying weather conditions along the airways. Such studies are valuable in laying out new airports and airways and for determining regular flight schedules. Investigations under this project are conducted at the central office at Washington, D.C., and at stations where qualified personnel and the necessary data are available.

Upper-Air Surveys and Investigations.--Numerous aerological surveys have been made determining average temperatures, pressures, humidities, densities, winds, etc., at various elevations for different sections of the country, as well as special studies and investigations of upper air conditions. Upper-air observations are classified and correlated with surface conditions in order to determine significant relationships which may be useful in forecasting or aid in a better understanding of the mechanics of the atmosphere. All observational data are forwarded to the central office of the Weather Bureau in Washington where they are summarized and classified. These data are then used for making special studies and investigations leading toward improvements in general and airway forecasting both as regards accuracy and length of time covered; meteorological conditions favorable for the formation of ice on aircraft; improvements in methods of pressure reductions to sea level and to the 5000-foot plane, and in increasing our knowledge of the mechanics of the atmosphere.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated available, 1937
Public Works Allotments (National Industrial Recovery Act):			
Physical improvements.....	$12,420	$ ~~367~~ 278	- -
Replacing river gages.....	67,017	- -	- -
Loans and Relief in Stricken Agricultual Areas:			
Transferred from Forest Service for compilation of climatalogical information in connection with the establishment of a shelter-belt in the Great Plains region.....	1,481	- -	- -
Emergency Relief Appropriation Act of 1935:			
Development of a method of long-range weather forecasting.....	- -	11,800	$5,900
Total, Emergency Funds (Direct allotments)	80,918	12,~~167~~ 078	5,900

BUREAU OF ANIMAL INDUSTRY

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1936.....	$178,220
Budget Estimate, 1937.....	178,220

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
General Administration.....	$169,362	$178,220	$178,220
Unobligated:			
Legislative impoundments.....	- - -	- - -	- - -
Other amounts unobligated	3,273	- - -	- - -
Total.....	172,635	178,220	178,220

WORK UNDER THIS APPROPRIATION

This appropriation is used for activities concerned with the general direction of the research, service, and regulatory work of the Bureau, including the expense of the Chief of Bureau's office, accounting, personnel, library, editorial activities, etc.

(b) ANIMAL HUSBANDRY

Appropriation Act, 1936.....	$757,663	
Allotment from "Experiments in Livestock Production in Southern United States".....	25,840	(a)
Transferred to "Dairy Investigations," Bureau of Dairy Industry, for Red Danish cattle investigations.....	-25,000	(b)
Total available, 1936.....	758,503	
Budget Estimate, 1937.....	808,503	
Increase.....	50,000	

(a) Part of total appropriation of $39,900 (Miscellaneous section). This appropriation is omitted as a separate item for 1937.

(b) Transferred from project for "Dual Purpose Cattle Investigations."

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
Swine husbandry investigations...	$98,790	$126,922	$132,422	+ $5,500 (1)
Sheep and goat husbandry investigations.....	129,292	133,586	141,886	+ 8,300 (1)
Horse and mule husbandry investigations.....	33,328	34,434	49,434	+ 15,000 (2)
Beef cattle husbandry investigations.....	148,302	153,202	162,702	+ 9,500 (1)
Dual purpose cattle investigations.....	70,962	73,318	76,018	+ 2,700 (1)
Poultry husbandry investigations.	157,206	231,180	240,180	+ 9,000 (1)
Certification of pedigrees of imported livestock.....	5,681	5,861	5,861	- - -
Total obligations.....	643,561	758,503	808,503	+50,000
Unobligated:				
Legislative impoundments.....	1,000	- - -	- - -	- - -
Other amounts unobligated.....	3,281	- - -	- - -	- - -
Total.....	647,842	758,503	808,503	+50,000

The increase of $50,000 for 1937 includes:

(1) A total increase of $35,000 under the five projects indicated by note "1" in the preceding table to provide for the more effective use of facilities at the Beltsville Research Center and at the Poultry Experiment Station, Glendale, Arizona. $3,500 for the Poultry Experiment Station, Glendale, Arizona is included in the $9,000 for the project "Poultry husbandry

investigations". This increase of $35,000 is urgently needed by the present staff for the proper conduct of research already under way. It is required to provide necessary additional fuel, electric current, water, janitor labor, and engineering services for the new laboratory buildings and for the purchase of necessary scientific instruments and supplies.

(2) An increase of $15,000 for "Horse and mule husbandry investigations" to develop true-breeding studs of mares and jacks for use in the production of superior mules of the types required in various farm operations.

According to the figures of the Crop Reporting Board of the Department of Agriculture, there has been a decrease of 1,120,000 mules on the farms of the United States during the ten years ending December 31, 1934. There was a decrease of 130,000 mules during the year ending December 31, 1934. The valuation of mules on farms on January 1, 1935 was $470,900,000, an average of $98.21; compared with a total of $401,596,500, or an average of $81.54 for the previous year. The farm valuation of mules on September 1, 1935 was $103.40, compared with $83.90 on September 1, 1934. It seems now that the downward trend of mule production has stopped, and there has been an active demand for mules of various classes from farmers, especially in those States where the mule has become firmly established as a work animal. These States are principally in the Cotton Belt and the bordering States of Tennessee, Kentucky, Missouri, Illinois, and Kansas. There seems to be a real shortage of good work mules, and this shortage is accompanied with a rapid upswing in prices. Since the interest in breeding mules has revived it has become apparent that there is a real shortage of good jacks for breeding purposes. It is proposed to establish a jackstock nursery for the purpose of producing jacks of superior breeding qualities for mule production. The jacks produced would be distributed in different States in cooperation with the State experiment stations in which they are placed, and records would be kept of their performance in producing mules when mated with different types of mares. This work will assist materially in rehabilitating an important livestock industry and provide valuable research data in mule production that will be of great value to the future of the mule industry.

WORK DONE UNDER THIS APPROPRIATION

General. -- The animal husbandry investigations of the Bureau of Animal Industry deal with the collection and dissemination of information on livestock problems of regional and national importance having to do with the breeding, feeding, and management of domestic farm animals, including poultry. Results are measured in terms of quantity and quality of the animals and their products, such as meat, eggs, wool, mohair, and farm power. These experiments often are conducted in cooperation with other bureaus and divisions of the Department, with one or a group of State agricultural experiment stations, with farmers, and other agencies.

Swine Husbandry Investigations. -- This work includes studies to indentify and develop strains of swine and to develop methods of feeding and management that will make possible the production of pork meat economically and profitably; and studies on conformation and yields, proportion of meat to bone, composition, tenderness, flavor, juiciness, and other characteristics of pork and pork products as influenced by variations in production factors and in processing and preparation, including slaughtering, chilling, cutting, curing, rendering of lard, storing, canning, and cooking. Swine normally represent about 10 percent of the value of all agricultural production in this country. Many problems exist and

new problems are constantly arising which call for solution. Results achieved have been highly valuable, and continuation of the work is undoubtedly essential if the needs of the industry are to be served.

Sheep and Goat Husbandry Investigations. -- This work deals with the factors affecting production of lamb meat, wool, goats' milk, and mohair. Studies in breeding and development of types most suitable for production and studies in the methods of management and feeding are made with sheep and goats and the results tabulated and interpreted for other workers and for the industry. The experimental animals are of known ancestry for many generations back. Data are kept on them from birth to slaughtered carcass, including such factors as productivity, rate of growth, earliness of maturity, and quality of production. Many of the new principles which have resulted from these studies in the past have been made use of by the sheep and wool and mohair industries.

Horse and Mule Husbandry Investigations. -- This project consists of studies in breeding, feeding, management, cost of production and maintenance, and utilization of horses and mules, including work with both light and draft breeds of horses and physiological studies in the rearing of orphan foals. Information on stallion enrollment in the various States having stallion enrollment laws is conpiled and distributed. A nationwide shortage of work stock and increased interest in the breeding of horse and mule replacements created a demand for information looking toward improved breeding stock.

Beef Cattle Husbandry Investigations. -- This work consists chiefly of research in problems affecting breeding, feeding, and management of beef cattle and the quality of their meat. It includes studies in range livestock production, in feeding and fattening various classes of beef cattle under both farm and range conditions, beef cattle record-of-performance studies, breeding studies to develop crossbred cattle which will be especially adaptable to certain sections of the United States having unfavorable climate, and the development of strains within the established beef breeds that will have superior germ plasm for efficiency and quality of production. Pasture management and grazing studies, mineral deficiency problems affecting range cattle production, and special vitamin and other nutritive requirements also are dealt with.

Dual-Purpose Cattle Husbandry Investigations. -- This work consists chiefly of research in problems relating to breeding. It includes studies in the development of true breeding strains of Milking Shorthorn and Red Polled cattle for high fertility, desirable conformation, and comparatively high production of both beef and milk; studies of the performance of the offspring to determine the relative values of germ plasm of different strains; meat studies to determine the quality of the meat; and studies of the nutritive requirements of dual-purpose cattle for growth and production.

Poultry Husbandry Investigations. -- The work under this project consists chiefly of research in breeding, feeding, hatchability, and flock management. The breeding studies are conducted for the purpose of enabling producers to develop, through selection and breeding, more efficient egg and meat producing strains to improve the quality of eggs, breeding stock, and poultry meat. Studies in poultry nutrition are carried on in order to develop efficient diets for all classes of poultry and to develop methods for the most efficient utilization of feed in order to promote the most economical production of eggs and poultry meat of superior quality. Other lines of research embrace a study of fundamental principles involved in various physiological practices associated with the production of poultry and poultry products and studies on the most efficient meth-

ods of incubation. Cooperation is had with the States through official State agencies in putting the regulations of the National Poultry Improvement Plan into effect, designed to improve the quality of hatching eggs, baby chicks, and breeding stock produced by those participating in the plan. Over 6,000,000 farmers raise poultry, and there are several thousand commercial poultry producers. There are over 400,000,000 laying hens kept in the United States annually and the average egg production is approximately 90, whereas improved methods of feeding and proper selection could readily increase this to 150, and further improved methods to an average of 170. Approximately 800,000,000 chicks are raised in the United States annually, most of them in commercial hatcheries, of which there are approximately 12,000.

Certification of Pedigrees of Imported Registered Livestock. -- This work is regulatory and consists of the certification of purebred animals imported into the United States under the provisions of paragraph 1606 of the Tariff Act of 1930. It comprises the examination of pedigrees of the animals imported and certification to the Collector of Customs at the port for entry free of duty.

(c) DISEASES OF ANIMALS

Appropriation Act, 1936	$381,755	
Allotments, for research, from:		
"Eradicating Tuberculosis".....	28,500	(a)
"Eradicating Hog Cholera"	27,520	(a)
Total available, 1936.....	437,775	
Budget Estimate, 1937.....	437,775	

(a) These allotments are being carried forward as transfers in the estimates for 1937 in order to conform to the uniform project system of the Department.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Investigations of nonparasitic diseases of animals:			
Hemorrhagic septicemia investigations	$3,718	$2,175	$2,175
Equine encephalomyelitis and forage-poisoning investigations	9,396	9,565	9,565
Mammitis investigations.....	6,923	6,525	6,525
Anaplasmosis investigations	10,562	11,415	11,415
Rabies investigations	2,077	3,815	3,815
Anthrax investigations	6,923	6,525	6,525
Swine erysipelas investigations	3,956	4,895	4,895
Miscellaneous disease investigations	23,973	21,803	21,803
Contagious-abortion investigations	71,436	78,182	78,182

Projects	1935	1936 (Estimated)	1937 (Estimated)
Investigations of nonparasitic diseases of animals - Continued.			
Stock poisoning by plants, Investigations of.	$18,911	$20,650	$20,650
Poultry diseases investigations	27,588	29,890	29,890
Swamp-fever investigations	------	15,000	15,000
Tuberculosis investigations	26,718	28,500	28,500
Hog-cholera investigations	26,475	27,520	27,520
Total, Investigations of nonparasitic diseases of livestock	238,656	266,460	266,460
Investigations of parasitic diseases of animals:			
Index catalogue of medical and veterinary parasitology and maintenance of parasite collection	7,805	8,000	8,000
Poultry parasite investigations	16,796	18,000	18,000
Swine parasite investigations	18,916	21,000	21,000
Parasites causing and transmitting anaplasmosis in cattle	9,386	9,500	9,500
Ox-warble investigations	44,380	45,000	45,000
Liver-fluke investigations	19,760	20,000	20,000
Roundworms in sheep, Investigations of	12,844	14,000	14,000
Horse parasite investigations	8,892	9,000	9,000
Miscellaneous parasite investigations, including parasites of dogs, cats, wild animals, etc.	17,191	17,000	17,000
Anthelmintics and insecticides for the destruction of parasites, Investigations for the development of	9,938	9,815	9,815
Total, Investigations of parasitic diseases of animals	165,908	171,315	171,315
Total obligations	404,564	437,775	437,775
Unobligated:			
Savings	4,636	- -	- -
Total	409,200	437,775	437,775

WORK DONE UNDER THIS APPROPRIATION

General.--The basic research work on animal diseases and parasites, which each year cause tremendous losses to livestock producers, is conducted under this appropriation. It is essential to know the causes of diseases, their mode of dissemination, and the life histories of parasites and their resistance to atmospheric conditions and chemicals before any effectual control or eradication methods may be devised and applied. This essential knowledge is gained only through research and experimentation.

Investigations of nonparasitic diseases of animals.--This project consists of research into methods of diagnosis, cause, mode of transmission, and methods of prevention, treatment, and control of the more important infectious and noninfectious diseases of livestock, including poultry. Work is conducted along the lines indicated in the work projects listed below:

Hemorrhagic septicemia investigations.--Previous investigations of hemorrhagic septicemia resulted in the development and improvement of biologics for the immunization of animals against this disease, which was responsible for losses in livestock estimated at upwards of a million dollars annually. Although these biologics have been effective in controlling the disease as it occurs in acclimated animals on the home premises, no satisfactory utilization of them has yet been found to safeguard the millions of feeder and stocker cattle that become exposed to the shipping-fever form of the disease while in transit from their home ranches and farms to other sections of the country where they are to be fattened. Investigations at this time are directed toward evaluation of systemic alkalinization as a means of controlling the shipping-fever form of the disease.

Equine encephalomyelitis and forage-poisoning investigations.--Losses in horses in various parts of the country have occurred for many years which until a few years ago had been generally considered to be due to spoiled forage (forage poisoning). Particularly severe losses have occurred in certain years. In 1930 it was shown that a severe epizootic in horses in California was due to an infectious agent, a filterable virus, producing an inflammation of the brain and spinal cord (encephalomyelitis). This specific disease has appeared in many of the States in the past few years and has been described as blind staggers, sleeping sickness, brain fever, etc. The objects of the investigations now being conducted are to make diagnoses as the disease occurs in the various States, so that known control measures may be inaugurated; to study modes of transmission, diagnostic methods, and immunizing agents for control; and to study the relationship between so-called forage poisoning and infectious encephalomyelitis.

Mammitis investigations.--Mammitis, mastitis, or garget, an inflammation of the udder, is the cause of great loss to the dairy industry. The objects of these investigations are to develop methods of sanitation and hygiene as a means of controlling the disease, to improve methods for diagnosis of the disease, to study vaccine therapy in order to develop an effective method of immunization against the disease, and to study modes of transmission of the disease.

Anaplasmosis investigations.--Anaplasmosis is a disease of cattle somewhat similar to tick fever. It was definitely recognized in the United States in 1924 and now exists in about 15 States. No control measures applicable to this country are yet available. The objective in these investigations is to determine the modes of transmission of the disease, to develop a serological test for the diagnosis of the carrier animals of the disease, and to develop an immunizing agent that is both safe and effective.

Rabies investigations.--This project covers studies on the diagnosis and methods of control of rabies in dogs and other animals. In recent years particular attention has been given from time to time to a study of the efficacy of the prophylactic vaccination of dogs as a means of controlling outbreaks of the disease.

Anthrax investigations.--Present investigations under this project are intended to evaluate on a comparative basis the different types of anthrax biologics that are available at the present time, consideration being given to safety, possibility of sensitization, rapidity of immunity production, degree of immunity, and duration of immunity. This information is needed by veterinarians and livestock sanitary officials to permit a scientific determination of the biologic best suited for each particular herd, the attending circumstances surrounding which may be different from those of other herds.

Swine erysipelas investigations.--It has been found in recent years that swine erysipelas in the acute form exists in a number of the States. These investigations are conducted in an endeavor to improve on the agglutination test for the diagnosis of the disease so that this may be made available for a practical field test for the diagnosis of the disease. Studies are being made on the factors that enhance the pathogenicity of the causative agent of the disease and on outbreaks of the disease in the field, the latter to gain information on control measures.

Miscellaneous disease investigations.--The diseases falling in this group, which include glanders, blackleg, paratyphoid infection of swine, foot-rot, alkali disease, and other miscellaneous diseases and pathological conditions of animals, are at this time subjects for study as occasion demands. While some of these diseases were at one time major problems, earlier special studies resulted in finding effective means for their control. The present activities concerning these diseases are largely those of diagnosis, since proper diagnosis is the first essential in formulating measures to combat outbreaks of disease.

Contagious-abortion investigations.--Abortion disease has for many years been growing in importance until it now ranks first among diseases that plague the dairy and cattle-raising industries. The object of this research is to gain sufficient knowledge of the disease to be able to at least reduce its ravages and, if possible, bring it under control and eradicate it.

Stock poisoning by plants, Investigations of.--In some localities the losses in livestock on account of poisonous plants are frequently very severe. It has been estimated that the average annual loss is about one million dollars and in exceptional years may reach several times that figure. Work is being carried on to determine what plants are responsible for these losses and to find means to prevent poisoning or to treat affected animals.

Poultry disease investigations.--The principal diseases now under investigation are laryngotracheitis, range paralysis, tuberculosis, pullorum disease, and fowl pox. These are widespread in distribution and are the cause of heavy losses to the poultry industry. In addition, a number of diseases to which poultry are susceptible but which are of lesser economic importance are subjects for study as suitable material becomes available and facilities permit. The objective is to formulate adequate control measures.

Swamp-fever infestigations.--Swamp fever is a widely distributed disease of horses and mules which at times has been of economic importance in certain sections of the United States. In 1927 the disease assumed economic proportions in the Mississippi Delta region, and investigations are now being conducted looking to the development of some treatment that will be effective either as a preventive or as a cure for the disease.

Tuberculosis investigations.--The investigation of animal tuberculosis was one of the earliest major projects of the Bureau of Animal Industry. Much has been learned of the nature of the disease, the manner in which it is spread, the methods of diagnosis, and means of prevention and control. Present methods of eradicating the disease are based on this work. The object of this investigation is to gain knowledge relative to the disease which will make possible its eradication in cattle, hogs, chickens, and other animals affected by the different types of tubercle bacilli.

Hog-cholera investigations.--Hog cholera is an extremely contagious disease. At times it has practically destroyed the hog-raising industry in some localities. In the entire country losses have reached 6,000,000 hogs ($65,000,000) in a single year. Present methods of immunization are expensive and are not invariably safe or successful, and a cheaper and more dependable method is being sought. Modes of dissemination of the disease are also being studied.

Investigations of parasitic diseases of animals.--Investigations are conducted on animal parasites, including morphology, life history, biology, pathogenicity, and control measures by means of treatment and prophylaxis. The more important parasite groups covered include the protozoa, nematodes, tapeworms, flukes, insects, and arachnids attacking domesticated and game animals, including birds. The basic work makes possible the precise identification and recognition of parasites and gives the information on which to base control measures. Therapy is established on the basis of critical tests of drugs. Work is conducted along the lines indicated in the work projects listed below:

Index catalogue of medical and veterinary parasitology and maintenance of parasite collection.--The object of this project is to maintain a complete catalogue and index of the world's literature on parasitology. This index catalogue provides a basis for research and affords prompt information in answering correspondence.

Poultry parasite investigations.--The poultry industry of the United States suffers large losses because of parasites of poultry. The objective of these investigations is to develop methods for protecting the industry from such losses.

Swine parasite investigations.--Swine parasites are the cause of large losses to the industry. The object of the work under this project is to lay a foundation of scientific fact on which to build measures for the control of parasites and to make available to the industry the data obtained so that losses may be reduced.

Parasites causing and transmitting anaplasmosis in cattle.--In 1924 and 1925 it was found that anaplasmosis was prevalent in the United States in areas outside the area in which cattle fever ticks were present, indicating that the eradication of the cattle tick, although resulting in the suppression of piroplasmosis did not control anaplasmosis. Consequently, the problem of anaplasmosis was made a project for consideration, the object being to ascertain what vectors carry anaplasmosis and to develop control measures of any practical sort.

Ox-warble investigations.--The object of this project is to lay a foundation for the eradication of ox warbles from the United States, since these parasites cause losses amounting to millions of dollars annually.

Liver-fluke investigations.--A survey of the fluke situation in 1912 indicated that the sheep liver fluke was prevalent along the Pacific Coast and the Gulf Coast, with extensions up certain river valleys to inland States. More recent surveys indicated that the fluke was spreading and was present in about 30 States, including many which were free from fluke in 1912. The damage to cattle livers has become an important item in connection with the increased value of livers in the treatment of pernicious anemia; hence, the evident need for control of this parasite.

Roundworms in sheep, Investigations of.--Previous investigations have developed or standardized several treatments for stomach worms and other roundworms of sheep. The object of the project is to ascertain the basic facts in connection with sheep roundworms and to develop treatments and control measures. These worms cause more losses in sheep than do any other

disease agencies, and in many places are the limiting factor in sheep production.

Horse parasite investigations.--Horses in general are menageries of parasites, many of these parasites being highly injurious and the cause of considerable losses. The object of the work under this project is to lay a foundation of scientific fact on which to build control measures and to make available to the people of the United States the data obtained so that losses may be reduced.

Miscellaneous parasite investigations, including parasites of dogs, cats, wild animals, etc.--Parasites of sheep, goats, and cattle are identical in many cases with parasites in deer and other wild ruminants, and some of our most important parasites of sheep and cattle have originated as parasites of wild ruminants in recent times. The same is true of parasites of domesticated and wild birds and of other animals, and any competent study of parasites of domesticated animals must take cognizance of parasites of wild animals. A number of parasites of dogs are transmissible to man, and this fact gives the parasites of dogs special importance.

Anthelmintics and insecticides for the destruction of parasites, Investigations for the development of.--The original object of this project was to establish the value of drugs in common use or at least recommended in the literature. This has been done. The next objective was to develop new drugs, and this has been done in some cases and is still being carried on effectively. The next objective is to ascertain basic co-relations between the efficacy of a drug and the chemical composition and physical properties of the drug, and such investigations are now actively under way.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
Agricultural Adjustment Administration--			
General Expenses (Jones-Connally Act):			
Transferred to Bureau of Animal Industry for elimination of diseased livestock and administrative expenses in connection with removal of surplus cattle:			
(1) For combating Bang's disease in cattle (total allotment, $25,155,000)	$10,687,175	$14,467,825	- - -
(2) For combating Mastitis in cattle (total allotment, $1,000,000)	390,000	610,000	- - -
Total A.A.A. funds (Jones-Connally Act)	11,077,175	15,077,825	- - -

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
Emergency Relief Appropriation Act of 1935:			
(3) For eradicating liver flukes in sheep and cattle (total allotment $200,000)	- - -	160,000	40,000
Act of August 24, 1935 (Public No. 320, 74th Congress):			
(1) For combating Bang's disease in cattle (total allotment $15,350,000)	- - -	4,000,000	11,350,000
(4) For experimentation in diseases of cattle, etc. (total allotment $300,000)	- - -	150,000	150,000
Total, Act of Aug. 24, 1935	- - -	4,150,000	11,500,000
Total, Emergency Funds (Direct allotments)	11,077,175	19,387,825	11,540,000
Grand total, 1935-1937, $42,005,000			

The following is in explanation of the foregoing projects:

(1) Bang's disease.--The object of this work is to aid livestock producers in freeing their cattle from this disease. This is accomplished by eliminating cattle which react to the blood test for Bang's disease (contagious abortion). This work is conducted cooperatively in the various States and is voluntary on the part of the owners, those desiring to participate signing an agreement with the Secretary which specifies the conditions under which the animals are to be tested, the herd handled, and the disposition of reactors effected. The work consists of collecting blood samples from cattle in herds submitted for test by the owners, the testing of samples in the field and in laboratories to determine whether the animals are reactors to the test, and the removal of reacting animals from the herd. These animals are disposed of by slaughter under Federal or State supervision, and the owner is compensated in part for the animals destroyed in accordance with rules and regulations prescribed by the Secretary.

(2) Mastitis.--The object of this work is to eliminate cows which show marked physical evidence of mastitis and thus assist owners in handling their breeding and dairy operations in a more efficient manner. The work consists of the physical examination of cows by veterinary inspectors to determine whether they show marked evidence of disease. Such animals are removed from the herd and disposed of by slaughter under Federal or State supervision, and the owner is compensated in part for the animals destroyed in accordance with rules and regulations prescribed by the Secretary.

(3) Liver flukes.--The object of this project is to provide expansion of the Bureau's regular work in the control of liver flukes and at the same time furnish unemployment relief. The work is being carried on in four States under the following allotments:

State	1936
Idaho	$50,000
Oregon	50,000
Utah	50,000
Washington	50,000
Total	200,000

(4) Experimentation in diseases of cattle, etc.--This project consists of a study of alleged remedies for abortion diseases to determine whether they possess any preventive or curative value. The studies of vaccines for abortion disease in cattle, especially under field conditions, are being broadened and intensified. Experimental work is also being carried on with mastitis.

(d) ERADICATING TUBERCULOSIS

Appropriation Act, 1936	$ 2,631,616	
Allotment to "Diseases of Animals"	28,500	(a)
Total available, 1936	2,603,116	
Budget Estimate, 1937	1,500,000	
Decrease	1,103,116	

(a) This allotment is being carried forward in the estimates for 1937 in order to consolidate all animal disease research under the item "Diseases of Animals".

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)	Decrease
Obligated:				
Tuberculin testing at public stockyards	$60,003	$71,000	$71,000	- - -
Eradicating tuberculosis in cattle (operating expenses)	974,276	1,032,116	1,032,116	- - -
Indemnities for animals slaughtered on account of tuberculosis	932,211	1,500,000	396,884	-$1,103,116 (1)
Total obligations	1,966,490	2,603,116	1,500,000	- 1,103,116 (1)
Unobligated:				
Legislative impoundments	1,500	- - -	- - -	- - -
Transferred to other appropriations	1,061,165	- - -	- - -	- - -
Other amounts unobligated	1,043,723	- - -	- - -	- - -
Total	4,072,878	2,603,116	1,500,000	- 1,103,116 (1)

(1) A decrease of $1,103,116 in the amount for Indemnities for animals slaughtered on account of tuberculosis is made possible by the availability of emergency funds, under which an intensive campaign for bovine tuberculosis eradication will be continued during the fiscal year 1937. Payment for indemnities are made from these emergency funds.

CHANGE IN LANGUAGE

The words "control and eradication of the" have been substituted for "investigating"; and the words "for their control and eradication" and "and for researches concerning the causes of the diseases, their modes of spread, and methods of treatment and prevention" have been eliminated in view of the transfer of such investigations to "Diseases of animals."

WORK DONE UNDER THIS APPROPRIATION

General. -- The object of this work is to control and eradicate tuberculosis among livestock under a uniform plan in cooperation with the States. This campaign was launched as a Federal-aid project after an extensive survey showed the disease was spreading. The States and livestock owners have looked to the Federal Government for leadership in this work since its inauguration and desire that this assistance be continued, as many failures occurred when independent efforts were employed. Approximately $9,000,000 was appropriated last year by the various States to assist in this campaign. The Department's appropriation has been divided to provide $1,103,116 for operating expenses for supervision and indemnity for animals slaughtered, and, $396,884 for the payment of indemnities.

Tuberculin testing of cattle at public stockyards. -- Breeding and dairy cattle offered for interstate shipment from public stockyards are required to be accompanied by a chart showing that they have passed a satisfactory tuberculin test. Bureau veterinarians supervise the tests to such animals for interstate shipment. This activity also includes supervision over the disposition of reactors to the tuberculin test, these reactors being shipped in large numbers in accordance with Federal and State laws to public stockyards to be disposed of for immediate slaughter.

Eradicating tuberculosis in cattle. -- The money appropriated for operating expenses is used to employ veterinarians, who administer the tuberculin test to individual herds of cattle under a uniform system known as the accredited herd plan and who participate in administering the tuberculin test to all cattle in a prescribed area under a national program known as the area plan. Veterinarians are also assigned to supervise the work of other cooperating agencies. Traveling expenses of veterinarians, maintenance of field offices, and miscellaneous administrative expenses are charged against the operating expenses.

Indemnities for animals slaughtered on account of tuberculosis. -- This fund is used to reimburse livestock owners in part for losses sustained because of having their cattle slaughtered on account of being affected with tuberculosis. Excellent progress has been made in eradicating tuberculosis in livestock because of the assistance rendered to farmers under this fund. During the fiscal year 1935, Federal indemnity was paid from this fund on some 55,615 claims, covering approximately 214,215 tuberculous animals.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
Agricultural Adjustment Administration, General Expenses (Jones-Connally Act): Transferred to Bureau of Animal Industry for elimination of diseased livestock and administrative expenses in connection with removal of surplus cattle, as follows:			
For eradicating bovine tuberculosis (total available, $13,750,000)	$9,500,000	$4,250,000	- - -
Act of August 24, 1935 (Public No. 320, 74th Congress):			
For eradicating bovine tuberculosis (total allotment, $4,000,000)	- - -	2,500,000	$1,500,000
Total, Emergency Funds (Direct allotments)	9,500,000	6,750,000	1,500,000
Grand total, 1935-1937, $17,750,000.			

The object of this work is to bring about the elimination of this disease more quickly than it could be accomplished by the use of the regular appropriations available for the purpose. This is being done by greatly expanding and intensifying the campaign to control and eradicate tuberculosis among cattle under the uniform plan in cooperation with the various States and Territories. The work consists of administering the tuberculin test to cattle to determine whether they are affected with tuberculosis and the removal of the reactor animals. All animals classified as reactors are disposed of by slaughter under Federal or State supervision. Owners are compensated in part for the animals destroyed in accordance with rules and regulations prescribed by the Secretary.

(c) ERADICATING CATTLE TICKS

Appropriation, 1936	$613,940
Budget Estimate, 1937	613,940

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Eradicating cattle ticks	$588,522	$613,940	$613,940
Unobligated:			
Legislative impoundments	1,000	- -	- -
Other amounts unobligated	5,575	- -	- -
Total	595,097	613,940	613,940

WORK DONE UNDER THIS APPROPRIATION

This appropriation is used cooperatively for the payment of salaries and travel, and office expenses, of veterinarians and agents in Alabama, Arkansas, Florida, Louisiana, Mississippi, Oklahoma, and Texas, in the eradication of the southern cattle tick, which spreads splenetic fever infection among cattle. As counties are cleaned up they are released from Federal quarantine, and their surplus livestock may then be shipped to markets without restrictions. The States contribute large sums to this work. The work is done under State laws and regulations, Federal money being expended for supervision, thus insuring that all measures of eradication be so carried out as to warrant the release of cleaned areas from quarantine.

EMERGENCY FUNDS

Direct Allotments

Projects	Estimated obligations, 1936	Estimated obligations, 1937
Emergency Relief Appropriation Act of 1935:		
For the elimination of cattle-fever ticks:		
Florida	$145,000	$55,000
Louisiana	455,000	99,000
Texas	495,000	205,000
Total allocation ($1,454,000)	1,095,000	359,000

The object of this project is to intensify the campaign for the eradication of the cattle-fever tick and at the same time furnish unemployment relief.

(f) ERADICATING DOURINE

Appropriation Act, 1936	$8,613
Budget Estimate, 1937	8,613

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Eradicating dourine	$4,981	$8,613	$8,613
Unobligated:			
Savings	3,350	- -	- -
Total	8,331	8,613	8,613

WORK DONE UNDER THIS APPROPRIATION

In cooperation with State livestock sanitary authorities and on Indian reservations with the Office of Indian Affairs, horses in areas where the infection of dourine is believed to exist are rounded up and samples of blood obtained for subjection to a laboratory test. Horses reacting to the test are slaughtered and owners other than Indians on a reservation indemnified by the State and Federal Government. Indemnity to Indians is paid by the Office of Indian affairs. Surplus stallions are castrated. Wherever possible the roundup in the early summer is followed by a further roundup and retest later in the season. It is hoped that with more vigorous effort this malady may soon be completely eradicated.

(g) HOG CHOLERA CONTROL

Appropriation Act, 1936	$373,424
Less Allotments for:	
"Diseases of Animals"	- 27,520 (a)
"Virus-Serum-Toxin Act"	-218,712 (b)
Total available, 1936	127,192
Budget Estimate, 1937	127,192

(a) Used for hog cholera research and estimated for 1937 under "Diseases of Animals" in order to consolidate funds for research.
(b) Regulatory work, estimated for 1937 as a separate item.

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Hog cholera control	$108,702	$127,192	$127,192
Unobligated:			
Savings	9,565	— —	— —
Total	118,267	127,192	127,192

CHANGE IN LANGUAGE

It is proposed to change the title of this appropriation from "Eradicating hog cholera" to "Hog cholera control," in view of the transfer from this item of the hog cholera research fund to "Diseases of Animals" and the setting up of a separate new item for administration of the Virus-Serum-Toxin Act. By substituting the words "control and eradication" for "investigating", with other minor alterations in the text, and by elimination of the proviso covering the administration of the Virus-Serum-Toxin Act of March 4, 1913, the authority under the paragraph will then be limited to the control phases of the work.

WORK DONE UNDER THIS APPROPRIATION

Hog cholera is the most destructive disease of swine in our country. The direct annual losses have varied from eighteen to sixty-five million annually. Measures for its control are carried on in cooperation with the various States. Under this item work is carried on in the control and eradication of hog cholera in the field by demonstrations, the formation of organizations, and other methods, either independently or in cooperation with farmers' organizations and State and county authorities. Meetings are held and demonstrations are made from time to time to gatherings of farmers and others interested in preventing losses. Outbreaks are investigated, swine diseases diagnosed, owners are instructed in methods to prevent losses, and local veterinary practitioners are assisted in the use of the preventive treatment. In sections of the South where no veterinary services are available Bureau inspectors immunize swine, in addition to their other duties, and in States where the laws and regulations permit laymen are trained to immunize swine.

(h) INSPECTION AND QUARANTINE

Appropriation Act, 1936	$681,174
Budget Estimate, 1937	681,174

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
1 Scabies eradication.....	$177,632	$185,784	$185,784
2 Control over interstate shipments of livestock for the purpose of preventing the spread of communicable diseases.....	268,155	299,700	299,700
3 Enforcement of the 28-hour law.....	39,384	29,795	29,795
4 Determination by inspectors in the field of the existence of diseases.....	5,834	5,965	5,965
5 Quarantine of animals at ports of entry...	10,966	9,190	9,190
6 Inspection of animals for import.....	65,045	59,730	59,730
7 Supervision over the importation of hides and other animal by-products, forage, etc.....	69,459	82,970	82,970
8 Inspection and testing of animals for export.....	5,234	8,040	8,040
Total obligations.....	641,709	681,174	681,174
Unobligated:			
Savings.....	16,986	- - -	- - -
Total.....	658,695	681,174	681,174

WORK DONE UNDER THIS APPROPRIATION

General.--This appropriation provides for the eradication of scabies in sheep and cattle, inspection of southern cattle, control of the interstate transportation of livestock, inspection of vessels, enforcement of the 28-hour law, inspection and quarantine of imported animals, including the establishment and maintenance of quarantine stations; supervision over the sanitary handling of hides, skins, wool, and other animal by-products, feeding materials, and fertilizers offered for importation; investigational and inspection activities relative to the existence of contagious diseases; and the inspection and mallein testing of animals.

1. Scabies eradication.--Employees are assigned to cooperate with State livestock sanitary officials in inspecting all cattle and sheep in infected areas and in supervising the dipping of all affected or exposed herds or bands. Field forces in the West also cooperate with the Office of Indian Affairs in control and eradication measures on the reservations. The prosecution of this work is essential in order to prevent the spread of the disease to the free areas of the country.

2. Control over interstate shipments of livestock.--Under this project is conducted the inspection service at public stockyards. All livestock received are inspected for communicable diseases, and animals found to be affected or exposed are given appropriate treatment or otherwise disposed of in such a way as to prevent the spread of diseases to country points. This service is of value to the producer (1) by affording a means of tracing diseased shipment to origin, thus enabling the local livestock sanitary officers promptly to apply appropriate measures, and (2) by preventing the further movement of diseased and exposed animals which, if it were not prohibited, would disseminate disease to noninfected premises and herds. An important activity under this project is the cleaning and disinfection of cars.

3. Enforcement of the 28-hour law.--The work under this project consists of inspections to prevent violations of the law requiring the humane treatment of animals in transit. Railroads on the whole are doing their utmost to observe the requirements of this law, and the situation during the past fiscal year was satisfactory.

4. Determination by inspectors in the field of the existence of diseases.--Funds allotted hereunder are intended to provide for cooperation with local authorities in the suppression of outbreaks of anthrax, glanders, and other communicable diseases of livestock not provided for by a specific appropriation. The funds are used to pay salaries and expenses of employees assigned to such work and other authorized expenditures involved in arresting opizootics of these different diseases.

5. Quarantine of animals at ports of entry.--In order to fully establish freedom from disease, import animals of certain kinds are held in quarantine at times of entry at our coast and border ports. Quarantine stations are maintained by the Department at New York and Baltimore. It will be essential to maintain them in good condition and available in order to meet provisions of the quarantine laws.

6. Inspection of animals for import.--The inspection of all import horses, cattle, other ruminants, and swine is required by act of Congress. Careful inspections at coast and border ports are essential to safeguard our domestic livestock industry from the menace of diseases of foreign origin. During the fiscal year 1935 approximately 300,000 animals were inspected before importation.

7. Supervision over the importation of hides and other animal by-products, forage, etc.--Inspectors at ports of entry supervise the sanitary handling and control of import hides, skins, hair, wool, gluestock, fertilizer of certain kinds, manure, previously used bagging, feeding materials, etc. In order to guard against the introduction of foot-and-mouth disease and rinderpest, consignments not properly certified in the country of origin are shipped in sealed cars to tanneries or other establishments for disinfection in process of manufacture or are otherwise controlled. Measures are taken to guard against the landing and feeding of garbage from ocean vessels provisioned with meat originating in regions in which either foot-and-mouth disease or rinderpest exists. A check is also kept upon importations of dressed poultry from any infected region to assure removal and destruction of the feet.

8. Inspection and testing of animals for export.--Livestock for export are inspected and in certain instances tested and, when found free from disease, certified as provided under specific regulations of this Department and as required by receiving countries.

(i) MEAT INSPECTION

Appropriation Act, 1936	$5,355,135
Budget Estimate, 1937	5,355,135

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Meat inspection operations at packing plants under the Federal meat inspection service..	$4,870,344	$5,210,890	$5,210,890
Determination of adulterations and other objectionable conditions in meat and meat food products by laboratory analysis	89,201	88,600	88,600
Inspection of imported meats and meat food products	23,232	29,775	29,775
Chemical, pathological, and zoological investigations relating to meat inspection.	22,743	25,870	25,870
Total obligations	5,005,520	5,355,135	5,355,135
Unobligated:	155,733		
Total	5,161,253	5,355,135	5,355,135

WORK DONE UNDER THIS APPROPRIATION

General.--The purpose of the Meat Inspection Service is to eliminate and dispose of carcasses and meat food products found to be diseased, unwholesome, or otherwise unfit for human consumption; to see that such meat and meat food products are prepared in a cleanly manner; to guard against the use of harmful dyes, chemicals, and other deleterious substances; to prevent the use of false or misleading names or statements on labels; and to supervise the interstate transportation, exportation, and importation of meat and meat food products.

Meat inspection operations at packing plants under the Federal Meat Inspection Service.--The object of this work is to see that the laws and regulations governing meat Inspection are properly observed. The inspection includes ante-mortem and post-mortem examinations of the animals to determine any disease or condition that might render the meat or any organ unfit for food purposes; the enforcement of sanitary requirements; supervision of the preparation and processing of the meat and products; reinspection of meat and meat products at various stages of processing and handling; supervision of the destruction for food purposes of all condemned meat and products and supervision of the labeling and marking of the meat and product.

Determination of adulterations and other objectionable conditions in meat and meat food products.--The purpose of this project is to ascertain whether meat and meat food products prepared in official establishments or under exemption or shipped interstate by farmers, as well as imported meats and meat food products, are properly labeled, sound, healthful, wholesome, and otherwise fit for human consumption, and to determine whether any prohibited substance has been used in their preparation or in or about the establishment; also to determine whether the water and ice used in the preparation of meat and meat food products are potable.

Inspection of imported meats and meat food products.--This work seeks to prevent the importation of meat and meat food products of cattle, sheep, swine, and goats which are not properly certified or which are falsely labeled or which are unsound, unhealthful, unwholesome, or otherwise unfit for use as human food or which contain any prohibited dye, chemical, preservative, or other harmful ingredients.

Chemical, pathological, and zoological investigations relating to meat inspection.--Under this project are conducted such researches and investigations as may be necessary to determine proper procedures to be followed in carrying out the inspection work and proper diagnosis and disposition of meat and products.

Meat inspection operations for other Government agencies.--Meat and products offered for delivery by contractors are examined for specifications. From ten to fifteen Government agencies avail themselves of this service and reimburse this Department for its cost.

(j) VIRUS-SERUM-TOXIN ACT

Appropriation, 1936	- -
Allotted from "Eradicating hog cholera"....	$218,712
Total available, 1936	218,712
Budget Estimate, 1937	218,712

Note.--This is submitted as a separate item for 1937 in order to clarify the appropriation and project set-up for the Bureau of Animal Industry.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Control of manufacture, importation, and shipment of viruses, serums, toxins, etc.	$211,750	$218,712	$218,712
Unobligated:			
Legislative impoundments	275	- -	- -
Savings	4,188	- -	- -
Total	216,213	218,712	218,712

WORK DONE UNDER THIS APPROPRIATION

Control of manufacture, importation, and shipment of viruses, serums, toxins, etc.--This work consists of the supervision of the production of biological products, including anti-hog-cholera serum and virus, in connection with the enforcement of the provisions of the Virus-Serum-Toxin Act, approved March 4, 1913, regulating the preparation, sale, barter, exchange, or shipment of viruses, serums, toxins, or analogous products produced in the United States and the importation of such products intended for use in the treatment of domestic animals. All the animals used in producing these biological products are inspected. Careful attention is given to sanitation, labeling, and the testing of the finished products for purity and potency.

(k) PACKERS AND STOCKYARDS ACT

Appropriation Act, 1936	$331,879
Budget Estimate, 1937	428,779
Increase	96,900

PROJECT STATEMENT

	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
Packers and stockyards administration	$316,703	$331,879	$428,779	+$96,900 (1)
Unobligated:				
Legislative impoundments	1,000	- - -	- - -	- - -
Other amounts unobligated	6,570	- - -	- - -	- - -
Total	324,273	331,879	428,779	+ 96,900 (1)

(1) The increase of $96,900 for 1937 is required to administer the provisions of the amendment to the Packers and Stockyards Act approved August 14, 1935 (Public No. 272, 74th Congress), providing for the regulation of the rates and practices of persons engaged in handling live poultry in interstate commerce.

The enactment of legislation by Congress to regulate practices and rates incident to the marketing of live poultry in large cities, particularly New York, has been urged by producers of live poultry and their organizations for some years. It was alleged that the marketing operations were attended with various unfair and deceptive practices and that the rates and charges for the services rendered in connection with the handling and sale of the poultry on a commission basis were exorbitant. Likewise, consumers in the large centers demanded legislation on the ground that the practices in the industry resulted in higher prices for live poultry bought by consumers than were necessary if the business were properly and economically conducted. The amendment to the Packers and Stockyards Act resulted from these demands. In brief, the amendment authorizes the Secretary to designate the cities in which practices exist which affect the prices received by the producers for live poultry and the prices paid by the consumers for dressed poultry and where the volume of poultry handled is sufficient to affect the price. After such designation, all persons engaged in handling and marketing live poultry are required to be licensed. If there are any violations of the provisions of the Packers and Stockyards Act by licensees, the Secretary is authorized after a hearing to suspend or revoke the licenses of the offenders. The Secretary is likewise authorized to invesitgate the reasonableness of all the rates and charges and, if he finds them unreasonable, to prescribe reasonable rates and charges. Licensees are required to keep books and records and render reports annually to the Secretary relative to their business operations.

CHANGE IN LANGUAGE

This paragraph has been amended by citing the Act of August 14, 1935, amending the Packers and Stockyards Act with respect to live poultry.

WORK DONE UNDER THIS APPROPRIATION

The work under this appropriation embraces supervision of the business of packers, stockyard owners, market agencies, dealers, and licensees engaged in interstate commerce, and includes regulation of practices and rates and charges for service rendered at posted stockyards and certain designated poultry markets. Jurisdiction is exercised through 20 field offices over approximately 1,300 market agencies, 3,200 dealers at 93 stockyards, 1,200 packers, and a large number of licensees throughout the country. Varied activities are carried on under this project, the more important of which are: (1) registration and bonding of market agencies and dealers at posted stockyards and licensing of live-poultry handlers in designated cities; (2) supervision of the testing and maintenance of livestock scales at posted stockyards and of live-poultry scales in designated cities; (3) valuation of the properties of stockyard companies and licensees which includes inventories and appraisals of the real estate and physical structures of such companies and licensees, together with comprehensive analyses of their financial operations and organization and complete audits of their books and records, for the purpose of obtaining information for the use of the Secretary in determining the reasonableness and the lawfulness of rates and charges for stockyard services rendered by stockyard companies and for services and facilities furnished by licensees; (4) investigations of the operations of commission men handling livestock and live poultry, and audits and analyses of their books and records in connection with the determination of rates which would be reasonable for them to charge for the purchase and sale of livestock at public markets and live poultry in designated cities; (5) investigations of complaints as to unfair and unjustly discriminatory practices on the part of market agencies, dealers, stockyard companies, packers, and licensees.

(1) ERADICATING FOOT-AND-MOUTH AND OTHER CONTAGIOUS DISEASES OF ANIMALS

This item continues the availability, for the fiscal year 1937, of the unexpended balance of the appropriation of $3,500,000 made in 1924 to be used in case of an emergency arising from an outbreak of foot-and-mouth or other contagious diseases of animals. The unexpended balance on June 30, 1935, was $1,315,000. No expenditures are contemplated during the fiscal year 1936 unless an emergency arises, but continuation of the availability of this fund is necessary to insure protection of the American livestock industry should an outbreak occur.

Please Tell any expenditures in 1935

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936
1. Agricultural Adjustment Administration (Transferred to Bureau of Animal Industry):		
(a) Salaries and Expenses: For field investigations in connection with the agricultural adjustment program.....	- - -	$ 975
(b) General Expenses (Jones-Connally Act): For cattle reduction campaign in drought-stricken areas.....	$767,507	- - -
Total A.A.A. funds, as above.....	767,507	975

Cattle-reduction campaign in drought stricken areas.--The object of this work has been to assist in the program of the Agricultural Adjustment Administration in reducing the cattle population in the sections of the country most severely afflicted by the drought. Animals on farms were inspected to determine whether diseased or emaciated to the extent of justifying condemnation and destruction on the premises, or whether in fit condition to be delivered to the Federal Emergency Relief Administration for immediate slaughter or for shipment to States where pasturage was available.

Projects	Obligated, 1935	Estimated obligations, 1936
2. Public Works Allotments (National Industrial Recovery Act): For completion of physical improvements begun in 1934:		
Glendale, Arizona:		
Construction of cottage	$ 154	---
Construction of laboratory.....	358	---
Construction of feed storage shed	172	---
Reconditioning irrigation system, building fences and roads	187	---
Brooksville, Florida:		
Completing water system	140	---
Repairs to and painting of buildings	477	---
Drainage of land	127	---
Road repairs	189	---
Cattle barn, feed lots, silos, etc.....	3,733	---
Sanitary comfort stations	407	---

Projects	Obligated, 1935	Estimated obligations, 1936
Jeanerette, Louisiana:		
Fence construction and repairs	$ 217	---
Repairs to and painting of buildings	315	---
Drainage	457	---
Road repairs	41	---
Repairs to water system	385	---
Building and facilities for slaughtering, cutting, and curing under farm conditions.	429	---
Laboratories, addition to office, irrigation system, etc.	4,852	---
Shed for record-of-performance steers	854	---
Beltsville, Maryland:		
Repairs and extension to water system	142	---
Fencing and fence repairs	2,372	$ 92
Completion of poultry fattening building	7,415	803
Bull barn	157	---
Sheep barn	449	150
Building for storage of farm machinery, equipment, and supplies	6,365	3,598
Remodeling abattoir	514	---
Repairing refrigeration system	1,202	6,823
Dual-purpose cattle barns	631	3
Repairs to beef cattle barn, bull pens, calf sheds, and lot	2,819	181
Roads and bridges on farm	236	84
Assembly building and comfort stations; swine record-of-performance project	202	---
Engineering administration and incidental expenses for animal husbandry projects; nutrition laboratory	1,027	124
New animal shelters (animal parasite studies)	1,756	37
Isolation laboratory (animal parasite studies)	1,567	25
Main laboratory building (animal parasite studies)	45,362	47
Nutrition laboratory, repair and extension of water system; reconditioning farm power line; completion of poultry fattening building; farm roads and bridges; goat barn and milk production equipment; moving hog equipment; physical improvements for poultry production record project; physical improvements for turkey breeding, nutrition, and management project; consulting engineering and architectural services and overhead expenses for Beltsville experimental farm; transportation		

Projects	Obligated, 1935	Estimated obligations, 1936
Beltsville, Maryland--Continued:		
and supervision of labor furnished by F.E.R.A. used in fence, water supply, sewer, and road construction and in clearing land; transient camp for F.E.R.A. labor	$445,273	$ 39,359
General administrative expenses; repair and extension of farm water system; transportation and supervision of labor furnished by F.E.R.A. used in fence, water supply, sewer, and road construction and in clearland	56,926	2,720
Poultry building; completion of poultry fattening building; physical improvements for poultry record-of-performance project	19,730	4,087
Fundamental poultry research building; repair and extension of farm water system; completion of poultry fattening building; physical improvements for turkey breeding, nutrition, and management project	40,480	2,683
Moving present frame buildings to new sites; completion of poultry fattening building	5,276	617
Feed and market poultry building	1,398	---
Laying houses (2)	2,183	258
Fencing poultry plant	108	---
Drainage	132	---
Moving hog equipment	5,050	1,948
Purchase of additional land	5,828	909
Moving Bethesda station to Beltsville	172,204	840
Change of location of main work-horse barn and site for main laboratory building	1,344	7
McNeill, Mississippi:		
Fencing	379	---
Drainage and road repairs	596	---
Miles City, Montana:		
Remodeling laboratory buildings	3,364	---
Fencing	2,561	---
Rearranging buildings and facilities for slaughtering, cooling, cutting, and curing under farm conditions	5,162	3,980
Essential repairs and painting of fifty buildings	1,451	---
Roads and bridges	161	---
Beef and dual-purpose cattle building and equipment and building for horses	976	---

Projects	Obligated, 1935	Estimated obligations, 1936
Middlebury, Vermont:		
Fencing	$ 135	---
Remodeling of cattle and horse barns and painting of buildings	798	---
Total, P.W.A. Allotments (N.I.R.).....	857,225	$ 69,375
3. Public Works Administration (Emergency Appropriation Act, 1935):		
Repairing hurricane damage to experimental farm, New Iberia, La.....	5,175	---
Repairing refrigeration system, Beltsville, Md.....	---	1,081
Physical improvements, Beltsville, Md.....	---	19,680
Total, Public Works Administration	5,175	20,761
4. Loans and Relief in Stricken Agricultural Areas (Emergency Appropriation Act, 1935):		
For relief in dought-stricken areas through reduction in number of surplus cattle	646,231	---
5. Emergency Relief Appropriation Act of 1935:		
For physical improvements at Chinsegut Hill sanctuary, Brooksville, Fla.....	---	28,900
Total, Emergency Funds (Direct Allotments), Items 1-5, above	2,276,138	120,011

EMERGENCY FUNDS -- BUREAU TOTAL
(Direct Allotments)

SUMMARY

Projects	Obligated, 1935	Estimated obligations, 1936	Estimated obligations, 1937
Agricultural Adjustment Administration (Transferred to Bureau of Animal Industry):			
1. Salaries and Expenses (aid in agricultural adjustment program).....	- - -	$ 975	- - -
2. General Expenses (Jones-Connally Act): Elimination of diseased livestock and administrative expenses in connection with removal of surplus cattle.....	$21,344,682	19,327,825	- - -
Total, A.A.A. funds	21,344,682	19,328,800	- - -
Public Works Allotments (National Industrial Recovery Act): For physical improvements....	857,225	69,375	- - -
Public Works Administration (Emergency Appropriation Act, 1935): For physical improvements.....	5,175	20,761	- - -
Loans and Relief in Stricken Agricultural Areas: For purchase of surplus cattle.....	646,231	- - -	- - -
Emergency Relief Appropriation Act of 1935:			
Elimination of cattle fever tick.....	- - -	1,095,000	359,000
Eradicating liver flukes in sheep and cattle.....	- - -	160,000	40,000
Physical improvements.....	- - -	28,900	- - -
Total Emergency Relief.....	- - -	1,283,900	399,000
Act of August 24, 1935:			
Elimination of diseased cattle, etc.....	- - -	6,650,000	13,000,000
Total, Emergency Funds (Direct Allotments)	22,853,313	27,352,836	13,399,000

PASSENGER-CARRYING VEHICLES

Authorization for the purchase of 104 passenger-carrying automobiles for the Bureau of Animal Industry is proposed in 1937, at an estimated cost of $54,300. 64 are replacements and 40 are additional, in lieu of 14 trucks to be turned in, making a net increase of 26 vehicles. These are needed in connection with tuberculosis eradication work. Compared with the authorization of $55,325 for 1936, this represents an estimated decrease of $1,025 in expenditure. The proposed purchase would enable the avoidance of the continued use of worn-out cars at excessive maintenance costs. Automobiles are an absolute necessity in carrying on the Bureau's activities in the eradication and control of animal diseases, such as cattle ticks, scabies, bovine tuberculosis, and control measures on hog cholera. Ranches and farms to which there are no means of public conveyance are constantly visited in the application of the tuberculin tests, enforcement of dipping regulations, and in supervision of the cleaning and disinfection of infected premises. The Bureau finds also that it is more economical and satisfactory to own its cars than to authorize the general use of privately owned vehicles for official work.

Bureau of Dairy Industry

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1936	$66,075
Allotment from "Dairy Investigations"	1,920 (a)
Total available, 1936	67,995
Budget Estimate, 1937	67,995

(a) Carried forward by means of transfer in the estimates for 1937, to cover salary of one employee. The appropriation for "Dairy Investigations" is reduced accordingly in the estimates for 1937.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
General administration and business service	$60,202	$67,995	$67,995
Unobligated:			
Savings	27	- -	- -
Total	60,229	67,995	67,995

WORK DONE UNDER THIS APPROPRIATION

The work conducted under this appropriation includes the direction of research, engineering, information, library, and service activities, the administration of fiscal and property work, and general supervision of personnel.

(b) DAIRY INVESTIGATIONS

Appropriation Act, 1936	$570,104
Allotments from:	
"Animal Husbandry," Bureau of Animal Industry (red Danish cattle research) +	25,000
"Experiments in Livestock Production in Southern United States" (Miscellaneous) ..... +	10,415
Allotment to "General Administrative Expenses," Bureau of Dairy Industry	- 1,920
←Total available, 1936	603,599
←Budget Estimate, 1937	636,099
←Increase	32,500

Note.--The foregoing allotments are carried forward by means of transfers in the estimates for 1937.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase or decrease
Obligated:				
Investigations of milk and butterfat production of dairy cows:				
Investigations of inheritance of milk and butterfat production.	$1 4,491	$170,505	$157,505	-$13,000 (1-a)
Investigations of physiology of milk secretion and reproduction	16,484	16,327	16,327	- - -
Investigations of relation of conformation to producing ability	13,850	13,951	13,951	- - -
Investigations of the effects of proteins, minerals, vitamins, and other basic elements of nutrition on milk secretion and health of animals	72,357	73,153	80,153	+ 7,000 (1-b)
Investigations of the influence of feeding and management on level and cost of milk production and growth	67,810	68,036	68,036	- - -
Studies of dairy herd improvement association records to determine the effect of the application of breeding and feeding practices on level and economy of production	57,009	57,050	92,050	+35,000 (1-c)
Total, Investigations of milk and butterfat production of dairy cows	372,001	399,022	428,022	+29,000 (1)

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase or decrease
Obligated--Continued				
Market-milk investigations:				
Dairy sanitation research	$10,612	$11,978	$11,978	- - -
Milk-plant management investigations	3,774	4,686	4,686	- - -
Milk quality improvement investigations	11,413	12,156	12,156	- - -
Total, Market-milk investigations ...	25,799	28,820	28,820	- - -
Investigations of the utilization of milk in the manufacture of milk products:				
Basic investigations of the bacteriology and chemistry of milk.....	11,801	17,596	17,596	- - -
General investigations of ice cream manufacture	12,079	12,801	12,801	- - -
General investigations of the manufacture of butter and by-products	21,726	19,153	19,153	- - -
Condensed, evaporated, and dried milk investigations	28,852	25,858	25,858	- - -
General investigations of cheese manufacture	24,075	28,618	28,618	- - -
Factory investigations for quality improvement of butter, cheese, and other milk products..	10,342	44,370	44,370	- - -
Introduction into commercial factories of new and improved methods of manufacturing milk products and by-products	25,458	25,046	25,046	- - -
Inspection of renovated butter factories and of dairy products for export (regulatory work).....	2,069	2,315	5,815	+ 3,500 (2)
Total, Investigations of the utilization of milk in the manufacture of milk products	136,402	175,757	179,257	+ 3,500 (2)
Total obligations	534,202	603,599	636,099	+32,500
Unobligated:				
Legislative impoundments	1,770	- - -	- - -	- - -
Other amounts unobligated	3,453	- - -	- - -	- - -
Total	539,425	603,599	636,099	+32,500

The Budget Estimate for 1937 includes provision for the red Danish cattle work, which has been transferred from the Bureau of Animal Industry; provision for the dairy work at New Iberia, Louisiana, heretofore conducted by allotment from the separate appropriation entitled "Experiments in Dairying and Livestock Production in Southern U.S.", which has been omitted as a special item for 1937; a decrease of $1,920 by transfer to "General Administrative Expenses" and an increase of $32,500 in working funds, as follows:

(1) An increase of $29,000 in the project "Investigations of Milk and Butterfat Production of Dairy Cows", as follows:

(a) A decrease of $13,000 in the item for red Danish cattle. The Act for 1936 appropriated $25,000 under the Bureau of Animal Industry for investigating the possibilities of red Danish cattle in the United States. This was transferred to the Bureau of Dairy Industry, and a considerable portion of the initial appropriation was expended for the purchase of the animals and for freight and other expenses incident to their transportation to this country. It is estimated that $12,000 will be sufficient for conducting the investigations work contemplated during the fiscal year 1937.

(b) An increase of $7,000 for dairy cattle nutrition investigations. The capacity of the nutrition laboratories to produce effective results is restricted by the number of experimental animals used. Unless additional funds are provided the Department is faced with the necessity of reducing the number of animals with a consequent restriction in the scope of the work being conducted. Experiments of this character must of necessity be continued for long periods of time, and results are measured largely through the offspring of the experimental animals. The disposal of any considerable number of animals would result in the loss of data which have been accumulated through years of research.

(c) An increase of $35,000 for establishing a system whereby the the records of all cows on test in dairy herd-improvement associations will be permanently recorded. These records will be studied and analyzed in order to identify and select those dairy cows and dairy sires that have the capacity to transmit to their offspring inheritance for high milk and butterfat production. Once identified, these superior animals, particularly sires, will be used extensively in order that their superior qualities may be disseminated throughout the dairy cow population.

The urgent need for improvement in dairy cattle is evidenced by the fact that the average butterfat production of all dairy cows in the United States is only 158 pounds per cow per year. The cows on test in dairy herd-improvement associations have an average butterfat production of 322 pounds per cow per year.

With the permanent record system in operation superior animals will be identified in great numbers. The 365,000 cows on test in dairy herd-improvement associations will serve as a national breeding herd from which superior stock may be supplied to our native dairy herd of 25 million dairy cows.

This work is conducted in cooperation with the States and is fundamental to general improvement of the dairy herds of the country, both large and small.

(2) An increase of $3,500 for strengthening the regulatory work of the Bureau. Recent revision of the regulations pertaining to process or renovated butter has increased the Bureau's inspection activities in enforcing the sanitary and branding provisions of the process butter law. The prevention of improper branding of this product should promote the sale and use of regular butter. The Bureau is also required by law to inspect and to certify to "the purity, quality, and grade of all dairy products intended for export". Dairy products valued at something over five million dollars are exported annually through eleven widely scattered ports. Information which has been obtained tends to show that some of the products exported are below the standards of quality required for such products. If the quality of dairy products exported is made comparable through more stringent inspection to the quality of such products consumed domestically, the value and reputation of our export trade should be enhanced. Likewise, such inspection service should serve to protect exporters of legitimate and high-quality products against the exporters of inferior products.

WORK DONE UNDER THIS APPROPRIATION

General.--The work conducted under this appropriation involves scientific research and experimentation in practically every phase of the dairy industry. It contemplates the development of fundamental principles of dairy cattle breeding, feeding, and management; problems in sanitary and economical methods of producing, transporting, processing, and distributing market milk and cream for utilization in fluid form; new methods of manufacturing dairy products and the improvement of existing methods of manufacture; the effective utilization of dairy by-products through the development of new uses for such by-products; and the introduction of such new and improved processes of manufacture into commercial creameries and cheese factories.

Investigations of milk and butterfat production of dairy cows.--There are about 25,000,000 milk cows in the United States at present. These animals are fed and cared for on 4,900,000 farms, or on about 73 percent of the farms of this country. There are approximately 20,000,000 people occupied part or full time on these farms in milking and caring for these 25,000,000 cows.

In normal years the farm value of our dairy products exceeds $2,000,000,000. The magnitude of the dairy industry is indicated by comparing the value of its output with that of two other major industries. In 1931, when the milk produced on farms had a farm value of $1,661,000,000 the output of the steel industry was valued at $1,714,214,000 and the output of the automobile industry at $1,387,517,000. The gross income from dairy products constitutes between 20 and 24 percent of the total income from all farm products; it provides approximately 50 percent as much income as all crops, and 40 percent of the income from all animal products.

Although the total money value of the dairy industry compares favorably in magnitude with that of other great industries, its individual units are small and under the ownership and direction of a large number of people. This divided ownership makes it impossible for the industry itself to conduct research for its advancement and guidance, as in the case of other great industries that are under centralized control. Yet being an industry that affects the livelihood of so many people, and to a great extent the health of all the people, and upon which the continued fertility of our soils largely depends, its advancement and welfare is a matter of national importance.

That help is needed is shown by the low average production per cow--estimated for 1934 to be 4,030 pounds of milk containing 158 pounds of butterfat. Only about one-third of these 25,000,000 cows produce enough to return a profit to their owners.

Investigations of improved methods of breeding, feeding, pasturing, housing, management, testing and judging dairy cows so that the business of dairy farming will be made more efficient and more profitable; that the dairy farmers may produce a product most beneficial to the consumer from the standpoint of quality, safety and nutritive value and at a cost that will be well within the buying power of the consumer, are being conducted by the Bureau of Dairy Industry, through its Divisions of Dairy Cattle Breeding, Feeding, and Management; Dairy Research Laboratories (Section of Nutrition Investigations); and Dairy Herd Improvement Investigations, as follows:

(a) Investigations of inheritance of milk and butterfat production are conducted to determine the comparative effects of out-breeding, line-breeding, and in-breeding in fixing an inheritance for high and uniform levels of producing ability in dairy cows; and to test the possibilities of breeding strains pure for high levels of production by the continued use of sires that have demonstrated that they possess an inheritance for high levels of production.

(b) Investigations of physiology of milk secretion and reproduction.--These investigations have indicated that a hormone of the pituitary gland is an important agent in normal milk secretion in dairy cows and may prove low production in some animals to be the result of a deficiency of this hormone, possibly hereditary in some strains. The effects of certain hormone injections in prolonging the period of fertility in aged bulls are being studied. Investigations to determine the effect of various factors on the fertility of dairy animals is another phase of the work under this project. Few sires breed beyond 10 years of age, and their transmitting ability cannot be definitely established until they are from 6 to 8 years of age. Sterility in dairy cows is causing enormous losses to dairy farmers annually. It is estimated that approximately 20 percent of all cows eliminated from all dairy herds of the country are disposed of because of sterility. The object of the investigational work conducted, therefore, is to determine the effect of certain dietary regimes in the correction and prevention of certain forms of sterility and the effect of consistent exercise on the fertility of males and females. This work is especially important in extending the useful life of valuable breeding sires. Many cases of sterility have been corrected by control of the

diet and through exercise. Artificial insemination as a means of expanding the use of valuable breeding stock is being given close study. All phases of this practice are being covered, including a method of extracting semen from the males, the best procedure for depositing sperm in the genital tract of the female, and methods of preserving and prolonging the life of sperm cells to enable their wider use. The time of ovulation is being investigated to determine the optimum time of mating in relation to the period of oestrum for securing pregnancy.

(c) Investigations of relation of conformation to producing ability are carried on for the purpose of determining the relationship, if any, between conformation and anatomy of dairy cows to their producing ability, and to establish, if possible, a scientific basis for judging and selecting dairy cattle from outward appearances.

(d) Investigations of the effects of proteins, minerals, vitamins, and other basic elements of nutrition on milk secretion and health of animals.--The investigations being conducted under this project contemplate the determination of the essential elements of a ration which will maintain a cow in good health and maximum milk production. It is evident that in many cases the milk yield is limited by specific factors which are lacking in rations considered ample by the usual standards, and that continued subsistence on a ration deficient in some respect may result in failure of reproductive functions and in failure to resist infection. For example, it has been found that different kinds and grades of roughages have a marked effect upon reproduction in dairy cattle. About 15 percent of the calvings of cows on pasture or when fed No. 1 alfalfa hay as their sole roughage are abnormal. The percentage of abnormal calving, however, ranges from 57 percent to 80 percent when the sole roughages are timothy or No. 3 alfalfa hay. The feeding of cod liver oil or carrots to animals receiving No. 3 timothy hay increased the percentage of normal calvings. It would seem therefore that the large proportion of abnormal calving of cattle on a No. 3 timothy hay ration is due to a deficiency of carotene or Vitamin A.

The importance of the quality of the roughage in determining the vitamin potency of the milk is indicated by the fact that calves which have been fed on whole milk produced by cows on No. 3 alfalfa or No. 3 timothy and are weaned onto a ration of hay of this same quality do not survive. If this ration is supplemented by cod liver oil or other satisfactory source of vitamin A normal growth is obtained. No material acceleration of growth is obtained by adding cod liver oil to a ration containing No. 1 alfalfa, indicating that roughage of this quality provides ample Vitamin A. However, for some reason still unknown, an excess of cod liver oil is toxic to calves.

(e) Investigations of influence of feeding and management on level and cost of milk production and growth.--The object of this project is to determine the influence of various feed-stuffs on growth and milk production of dairy cows; the comparative values of various roughages when cut at different stages of maturity and when made into hay or silage; the effect of fertilization and rotational grazing on the value of pastures for milk production; and the effect of various methods of handling, milking, feeding, exercising, and pasturing on the economy and level of milk production. Artificial drying of roughages is being tried out experimentally. The determination of feeding

methods and rations for calves to reduce mortality and assure growth during the early months of life is also an important phase of the work.

(4) Studies of dairy herd-improvement association records to determine the effect of the application of breeding and feeding practices on level and economy of production.--The work of this project contemplates studies of feed and milk production records of cows on test in herd-improvement associations to obtain accurate data for the intelligent selection and feeding of dairy cows according to their known producing ability, in order to develop methods that will lead to efficiency and economy of dairy production, the elimination of low and inefficient producing cows, the use of better sires, and the adoption of better feeding practices. The results of this work show that cows on test in dairy-herd improvement associations produce 90 percent more butterfat than average cows in the United States.

Market-milk investigations.--Under this project are conducted investigations in sanitary and economical methods of producing, transporting, processing, and distributing market milk and cream to be utilized in fluid form. These investigations include the production and handling of market milk under experimental as well as practical conditions on dairy farms and a study of community milk improvement through milk control and extension agencies on the area plan. Investigations of the construction, equipment, and efficient operation of milk plants for the processing and preparation for the market of fluid milk and cream are also conducted, as are investigations in the laboratory and at commercial dairy farms and plants to ascertain factors affecting the marketability of milk and cream.

The purposes of the work being conducted are to prevent losses due to souring, spoilage, and other causes; to increase the market value of milk to the farmer, increase consumption of milk, and make rural and urban milk supplies more safe; to effect economies in initial investments and operating costs of milk plants so as to reduce the spread between producers' and consumers' prices through greater efficiency in plant operation; to discover undesirable practices which impair the market qualities of milk and cream, and to devise remedial measures.

The results of these researches enable dairymen to reduce losses through rejected and low-quality milk; extend markets over greater areas; lessen the "spread" between producer and consumer by the introduction of more efficient methods; and increase consumption because of a more acceptable product.

Investigations of the utilization of milk in the manufacture of milk products.--Nearly one-half of the milk produced in the United States is used in making manufactured products. While the consumption of fluid milk is relatively high, the per capita consumption of manufactured dairy products is much lower than in most other dairy countries. This is due in some measure to the inferior quality of much of the domestic product, and this in turn is attributable to ignorance of the fundamental principles involved and to a lack of scientific control of manufacturing methods. Even under good conditions there are losses from abnormal bacterial fermentations and faulty technic.

In addition to the primary products made from milk, enormous quantities of by-products (skim milk, buttermilk, and whey) are produced. Although the cost of producing the milk solids in these by-products is nearly as great as the cost of producing the milk fat, adequate methods of converting the solids of these by-products into human food have been devised to only a limited extent. The object of this project is therefore to discover the basic principles involved in handling milk and manufacturing it into various products and by the application of these principles to improve the quality and reduce the cost of manufacture; to develop the domestic manufacture of certain dairy products now imported from foreign countries, and to establish these methods in the industry. The work is conducted under the following projects:

(a) Basic investigations of the bacteriology and chemistry of milk.--The manufacture of all dairy products is based on the control of bacteriological and chemical changes in milk, and the results of studies of these changes provide the basis for all laboratory investigations of an applied nature. Therefore, work on the bacteriology and chemistry of milk is fundamental to practically all investigational work dealing with the manufacture of milk products. Such work was begun by the Bureau of Dairy Industry with an investigation of the numbers and kinds of bacteria surviving pasteurization and the chemical changes produced in milk when it is heated. It has included such work as taxonomic studies of the colon-aerogenes group, the lactobacilli, the bacteria producing alkaline reaction in milk and the proteolytic bacteria of milk, a determination of the hydrogen ion and its relation to the growth of bacteria, and a study of the nature of the lipoid substances. Such studies have frequently led to unforeseen results of great value.

The possibilities of light as a means of controlling reactions, not only of a purely chemical nature but of life processes as well, are just beginning to be realized. In recognition of this fact, work is in progress which will yield important information concerning the action of different kinds of light upon bacteria.

The physico-chemical changes brought about in milk due to bovine mastitis and the improvement in the methods used in detecting the disease are important when it is considered that from 40 to 60 percent of the milking cows of this country are affected with this disease in one form or another. Investigations are under way to determine the normal sequence of the changes occurring in the milk before and after the onset of the disease and the effect of this abnormal milk when used in the manufacture of cheese.

The identity of the combinations and forms in which many of the chemical constituents of milk exist and the changes which take place in these constituents during manufacturing processes have never been definitely established. Progress in this direction will be of great value in controlling manufacturing processes. Fundamental investigations of these problems are under way.

(b) General investigations of ice cream manufacture.--Ice cream making has been developed almost entirely by empirical methods, with little understanding of the physical and chemical principles involved. The rapid development of the industry from small plants operating a single freezer to

great factories supplying large districts has introduced many problems in collecting and storing raw materials and the production of a uniform product. The purpose of these investigations, in addition to solving manufacturing difficulties, is to develop methods of manufacture whereby the quantity of milk solids may be increased and the quality of the product improved.

(c) General investigations of the manufacture of butter and by-products.--In the manufacture of butter and cheese, over 2,500,000,000 pounds of milk solids are produced annually in the form of skim milk, buttermilk, and whey. While only a relatively small part of this is actually wasted, from the standpoint of its high food value the most of it is utilized very inefficiently. The more effective utilization of this material by creating new products and improvement of the quality of the old ones are other phases of the research work being conducted. For example, methods of making casein, used extensively in adhesives and in coating paper, have been perfected and standardized until it is now possible to make a uniform grade especially suited to these purposes. The causes of foaming, one of the serious defects in making paper-coating solutions, have been determined and remedied.

Methods for the separation of lactalbumin, the soluble protein of milk, from the whey have been developed. The whey, obtained as a by-product in the manufacture of cheese and casein, contains large quantities of lactose or milk sugar for which there is now only a limited market. The process of separating this sugar has been simplified and an efficient method of converting it into lactic acid has been developed. Further studies are under way to discover methods of converting the lactose or the lactic acid produced by its fermentation into products of value in the arts. New uses for all of these by-products are being sought.

(d) Condensed, evaporated, and dried milk investigations.--Three methods for the preservation of milk have been successfully developed commercially. These are the evaporation of milk under vacuum with the addition of sufficient cane sugar to preserve it (condensed milk); the evaporation under a vacuum and heat sterilization in the final container (evaporated milk); and the reduction to dryness (dried milk). The first method changes the composition of the milk and is falling into disuse. The application of the second is limited because the sterilization gives the milk a cooked flavor which most consumers find objectionable. The powder obtained by the third method soon acquires an off-flavor through oxidation. If it were possible to prepare a concentrated milk which would keep indefinitely and, on restoration to its original volume, have the flavor and nutritive value of fresh milk, the problem of distribution would be greatly simplified and consumption increased. A process by which bacterial spores may be made more sensitive to heat is being investigated. If such a process may be worked out the sterilization temperature of evaporated milk may be materially lowered with a consequent disappearance of the cooked flavor of this product.

(e) General investigations of cheese manufacture.--The United States imports over 60,000,000 pounds of cheese annually. To make this quantity of cheese requires the milk from 150,000 average cows. This imported cheese is nearly all of those varieties which command relatively high prices and consequently yield greater returns to the producers of the milk than the ordinary Cheddar cheese.

While the quantity of cheese manufactured in this country is greater than in any other single country, the per capita consumption is lower than in most of the other dairy countries, due partly to the inferior character of the domestic cheese and in some measure to the unattractive packages in which it is marketed. If this country's per capita consumption of cheese was on a par with most European countries, the number of dairy cows would have to be at least doubled in order to supply the necessary amount of milk.

Investigations being conducted by the Bureau of Dairy Industry have for their object determination of the biological and chemical factors involved in the production of the characteristic flavors and physical properties of various foreign and domestic varieties of cheese. They have for their purpose the improvement of the quality of domestic cheese to provide an additional market for milk by replacing imported cheese with cheese of domestic manufacture.

The manufacture of Swiss and Cheddar cheese from pasteurized milk presents difficulties in developing texture and flavor. These problems are being studied with a view to making pasteurization universal. Work has also been started on some of the milder-flavored, quick-ripening French and Italian cheeses. The ultimate aim of these investigations is to improve the quality of cheese through better milk control, culture control, the standardizing of manufacturing procedures, and careful regulation of the curing conditions, so that the manufacture of all varieties of cheese may be placed upon a more scientific basis. Progress is being made in the direction of modernizing the packaging of cheese.

(f) Factory investigations for quality improvement of butter, cheese, and other milk products.--The work conducted under this project is designed to ascertain the need for new and improved processes of manufacture and to determine factors affecting the quality of butter, cheese, and other dairy products.

Many creameries are manufacturing butter which is below a reasonable standard for good table butter, the manufacturing processes employed are not in accordance with the best practices, and management policies are, in some respects, antiquated. At plants where these conditions prevail the prices paid farmers for butterfat are relatively low. As a result of work conducted, excessive losses of butterfat in the manufacturing operations have been eliminated, and the quality of cream received from farmers has been materially improved as a result of paying for cream on the basis of the quality of butter that can be made from it.

(g) Introduction into commercial factories of new and improved methods of manufacturing milk products and by-products.--The object of this project is to demonstrate to commercial factories the value of improved manufacturing methods and to introduce the manufacture of new products. This applies particularly to new methods and products developed in the Dairy Research Laboratories and includes the collection of information about current commercial practices and the investigation of processes in other industries which offer possibilities of extending the use of dairy products.

(h) Inspection of renovated butter factories and of dairy products for export.--The administration of regulatory acts relating to process or renovated butter and to the certification of the purity, quality, and grade of dairy products intended for export is a function of the Bureau conducted under this project. The regulatory powers of this Bureau relating to process or renovated butter have recently been materially broadened through a revision of the administrative regulations of the Bureau of Internal Revenue. Tentative revision of regulations pertaining to all dairy products intended for export has also been made. The enforcement of such regulations at principal ports will prevent the improper or fraudulent labeling of dairy products and thereby insure the exportation of dairy products of a higher quality.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936
Public Works Allotments (National Industrial Recovery Act):		
Physical improvements at dairy experiment stations:		
Beltsville (Md.) Research Center	$145,476	$ 671
Mandan (N. Dak.) field station	2,547	36
Total, P.W.A. allotments (N.I.R.).	148,023	707
Loans and Relief in Stricken Agricultural Areas (Emergency Appropriation Act, 1935):		
Transferred from Agricultural Adjustment Administration for cooperative investigations of feeds and feedstuffs in connection with agricultural adjustment programs	1,180	----
Emergency Relief Appropriation Act of 1935:		
Terracing, fencing and repairing roads, Lewisburg (Tenn.) dairy station.	-----	3,000
Total Emergency Funds (Direct Allotments). . .	149,203	3,707

PASSENGER-CARRYING VEHICLES

The authorization of $5,400 for the purchase of passenger-carrying vehicles contemplates the purchase of eight vehicles for use at the several dairy experiment stations to replace vehicles now in use, the continued operation of which would involve excessive maintenance costs, and to provide Government-owned vehicles for official travel in lieu of reimbursement to employees for the operation of their personally-owned cars. One of the principal activities of the dairy experiment stations is the breeding of dairy sires that will possess the ability to transmit uniformly high milk and butterfat production to their offspring. The proving of sires is accomplished through cooperation with dairy farmers in the regions served by the stations. Young bulls are loaned to cooperating farmers, and their transmitting ability is proved without expense to the Bureau. The farmers benefit through the use of these animals in improving their herds. These cooperative projects must of necessity be regularly inspected, and motor vehicles provide the only practicable means of transportation. Seven of the vehicles proposed to be purchased are for this purpose. The eighth is for assignment to the superintendent of the Beltsville (Md.) station for his use in traveling between the station and Washington and intermediate points.

BUREAU OF PLANT INDUSTRY

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1936. . . . . .$189,242
Budget Estimate, 1937. 189,242

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
General administration and business service	$182,431	$189,242	$189,242
Unobligated:			
Savings	288	- -	- -
Total	182,719	189,242	189,242

WORK DONE UNDER THIS APPROPRIATION

The direction of the research, service, and regulatory work of the Bureau of Plant Industry, administration of fiscal affairs, general supervision of personnel, administrative review and preparation of research and other publications and bibliographical and related library work, as well as the partial financing of such service activities as the photographic laboratory, are carried on under this appropriation.

(b) ARLINGTON FARM

Appropriation Act, 1936. . . .$49,414
Budget Estimate, 1937. 49,414

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Arlington Farm--maintenance of facilities for basic plant research	$46,050	$49,414	$49,414
Unobligated:			
Legislative impoundments	50	- - -	- - -
Other amounts unobligated	1,121	- - -	- - -
Total	47,221	49,414	49,414

WORK DONE UNDER THIS APPROPRIATION

A highly improved 400-acre tract is maintained in Virginia, near Washington, D.C., provided with specially equipped laboratories, greenhouses, barns, shops, and other buildings, to furnish facilities for conducting experiments and practical farm tests covering a wide range of research work, national in scope, principally for the Bureau of Plant Industry, but also for the Bureaus of Chemistry and Soils, Public Roads, Entomology and Plant Quarantine, and Agricultural Engineering, the Soil Conservation Service, and other branches. By furnishing similar facilities common to the many activities from a central station, duplication of effort and equipment is avoided and the cost of operation appreciably reduced. This item provides funds for the general maintenance of the plant and farm facilities. The work of other divisions in the Bureau and of other bureaus and departments is conducted at cost on a reimbursement basis.

(c) BOTANY

Appropriation Act, 1936.	$76,635
Budget Estimate, 1937.	76,635

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Botanical investigations.....	$35,795	$36,635	$36,635
Weed control investigations.....	- - -	40,000	40,000
Total obligations.....	35,795	76,635	76,635
Unobligated:			
Legislative impoundments.....	50	- - -	- - -
Other amounts unobligated.....	84	- - -	- - -
Total.....	35,929	76,635	76,635

WORK DONE UNDER THIS APPROPRIATION

General.--The work under this appropriation consists of the identification of wild and cultivated plants, special systematic studies of grasses that serve as a basis for forage, range, and erosion collection work; the domestication and improvement of wild plants, particularly the blueberry; and weed control investigations. Botanical studies conducted under this project serve as a starting point for numerous investigations made by the various branches of the Bureau of Plant Industry and other bureaus of the Department. With the increased demands made upon this project by the Forest Service, the erosion-control agencies, and the inevitable increase of duties resulting from development of the National Arboretum, work under this project has become of major importance. The studies and identifications under this project are essential to the development of accurate and dependable plans for future work.

Botanical Investigations.--Work on economic botany consists chiefly of studies and identifications of plants other than grasses for various bureaus of the Department. Assistance is also given to agricultural experiment stations, farmers, nurserymen, and other individuals and organizations. Information derived from this work is of primary importance in grazing and erosion work, investigations of plants poisonous to stock, forage experiments, and other lines of work. Accurate and dependable studies and identifications are essential as a basis for investigations if reliable results are to be obtained.

Work on grass investigations includes systematic studies of both domestic and foreign grasses which serve as a basis for important grass investigations from the forage and erosion standpoint. The collection of grass specimens maintained is the largest and most valuable reference collection in the world. The botanical studies conducted and publications built up as a result of these studies comprise a reference collection of information which is the basis of all important grass investigations of the Department. With the increased importance of forage and soil erosion projects, this work has become an important factor in the conduct of the investigations. Adequate and accurate reference is essential as a starting point for our grass projects.

The principal work on blueberry investigations has been the breeding of new varieties of blueberries earlier and later than those now in use, or of still better flavor and other desirable commercial qualities, or adapted to a latitude and climate farther south than existing varieties. The wide interest in blueberry culture has developed a rather extensive correspondence on the subject. The blueberry investigations have resulted in the domestication and improvement of the wild blueberry; in the addition of a luscious and healthful fruit to the dietary of city dwellers; in the establishment of a thriving and growing new industry of blueberry culture; and in the utilization of areas of special, strongly acid soils not adapted to other agricultural uses.

A similar project is conducted in breeding American varieties of gooseberries, using native species in themselves suited to our conditions but now of inferior quality.

Weed Control Investigations.--The work under this project is intended to provide information with respect to the most effective and least expensive methods of controlling or eradicating field bindweed, or European morning glory, and other noxious weeds. Investigations were inaugurated at the Fort Hays Experiment Station, Hays, Kansas, July 1, 1935, in cooperation with the Kansas Agricultural Experiment Station. Similar work will be undertaken in cooperation with other State experiment stations as soon as the necessary arrangements can be made.

The justification for these investigations lies in the very wide dissemination of bindweed in past years and the very great difficulty encountered by farmers in eradicating it. Farms otherwise productive have been abandoned because of bindweed infestation, and in several States the pest is considered so serious that loans cannot be secured on infested farms. It is very difficult to eradicate bindweed entirely once it becomes firmly established. It is believed that research with chemical treatments and with cultivating and cropping methods such as are contemplated under this project, will indicate feasible and economical methods of control. Funds for studies and development

of chemical means for combating the bindweed and other obnoxious weeds are carried in the appropriation for the Bureau of Chemistry and Soils.

(d) CEREAL CROPS AND DISEASES

Appropriation Act, 1936.	$501,923
Allotment from "Forage Crops and Diseases" (for forage sorghum production and improvement investigations)	+3,798 (a)
Total available, 1936.	505,721
Budget Estimate, 1937.	505,721

(a) This allotment is carried forward by means of a transfer in the estimates for 1937.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Barley investigations	$44,820	$55,855	$55,855
Corn investigations	107,720	136,505	136,505
Seed flax investigations	15,090	15,145	15,145
Sorghum investigations	22,071	26,098	26,098
Oat investigations	41,410	43,875	43,875
Rice investigations	39,890	44,155	44,155
Wheat investigations	173,354	184,088	184,088
Total obligations	444,355	505,721	505,721
Unobligated:			
Legislative impoundments	350	- - -	- - -
Other amounts unobligated	906	- - -	- - -
Total	445,611	505,721	505,721

WORK DONE UNDER THIS APPROPRIATION

General.--The work under this appropriation includes studies of cultural practices with cereal crops and the investigation of their possible improvement; comparison of yield and adaptability of different varieties to different regions and their quality for different uses, together with the breeding and selection of improved and better-adapted varieties; and the development of methods of control and of the diseases of all cereal crops, including the breeding of disease-resistant varieties. Cooperative experiments are carried on at most of the State agricultural experiment stations but no independent field stations are maintained.

The justification for this work lies in the importance of the cereal crops to the agriculture of the United States. Cereal crops not only supply directly an important part of the dietary requirements of the people, but as feed for livestock are the basis of our livestock and dairy industries as well. During the period from 1927 to 1931, inclusive, cereal crops occupied more than 225,000,000 acres each year, and even with the reduced acreages of 1934 they now occupy some 190,000,000 acres. Corn, the principal cereal crop, is the most important single crop of the country, in 1934 being grown on 92,500,000 acres. It is the backbone of American agriculture. On the basis of either unlimited or controlled production, increased efficiency and reduced costs are necessary for the profitable production of cereal crops and the consequent well-being of our agricultural population. Increased efficiency and reduced costs can only be attained through improvement in practices and varieties which will reduce the hazards incident to disease, reduced fertility, and, insofar as possible, the action of cold and drought. Without the improved varieties even now available the results of the disastrous drought during the season of 1934 would have been even more marked. The trained personnel engaged in this work also constitute an effective safeguard for the future welfare of the country. During the drought emergency the existence of this effective going organization made possible the location and conservation of adapted seed stocks for succeeding crops that otherwise were in serious danger of being lost.

Barley Investigations.--During the five years ending with 1931 barley was grown on approximately 12,000,000 acres annually. It has become increasingly important in recent years as a feed grain, and with the return of commercial brewing there is again available an important special market for malting barley. Quality is a most important factor in determining price, high quality carrying a substantial market premium. The control of diseases and the improvement of varieties to insure quality is imperative in order to meet market needs and to insure profitable production.

Corn Investigations.--Corn is the most important single crop grown in this country. It is the foundation of American agriculture. It normally occupies approximately 100,000,000 acres annually, and even with reduced acreage in 1934 there were 92,500,000 acres. Higher-yielding, better quality strains are needed to eliminate preventable hazards and to reduce production costs and losses in commercial channels. Disease control also is badly needed to prevent stand reduction in seedling corn and reduced quality in harvested grain. Special types for certain technical uses also should be developed.

Seed Flax Investigations (also buckwheat).--Seed flax production is not extensive, but in the areas where the crop is grown it is most important. During the five years 1927 to 1931 the average harvest was 2,915,000 acres. The amount produced is less than domestic consumption, and there is opportunity for profitable increase in the present acreage. The production of this crop is entirely dependent on disease-resistant varieties, and in emphasizing this factor, oil yield and quality heretofore have not been given necessary attention. There is definite need for improved varieties combining disease resistance with seed yield and oil yield and oil quality.

Sorghum Investigations (also broomcorn, proso, millets, etc.).--Sorghums are normally grown on some 7,000,000 acres annually. The acreage is increasing.

The crop is the standard feed and forage reliance of the entire south-central United States, where drought- and heat-resistant summer crops are essential. Certain special types that can be harvested to advantage with machinery used for other grain crops have been developed, but more are needed to cover the entire sorghum growing area. Disease resistance to reduce preventable losses also is needed. Broomcorn varieties producing better quality brush and less affected in quality by weather conditions also are badly needed.

Oat Investigations.--Oats is the most important small grain feed crop of the country. It is also most important as a rotation crop for use in seeding clover and grasses throughout the country. In normal times some 40,000,000 acres of the crop are grown annually, and in 1934, with reduced acreage, 33,348,000 acres were harvested. The quality of the crop is often seriously reduced by heat and drought and by diseases, and while progress has been made in developing better varieties much remains to be done.

Rice Investigations.--Rice is a specialized crop grown on a limited acreage so far as the country as a whole is concerned (750,000 to 950,000 acres annually), but where grown in Arkansas, Louisiana, Texas, and California it is the basis of agriculture and represents a large and specialized investment. Lands used for this crop also are less suited for other types of cropping. The peculiar conditions under which the crop is grown, requiring constant flooding of the land, introduce many problems in soil fertility, pests, diseases, and special considerations of culture and rotation that require solution. Varieties of better culinary value, also, are needed to increase market demands.

Wheat Investigations (also emmer, spelt, etc., and rye).--Wheat is the staple food crop of the country, is the basis of agriculture in a large and important area, supports an extensive manufacturing and processing industry, and is a most important export product. Profits in wheat production are dependent on reducing hazards from cold, drought, disease, and poorly adapted varieties and on the development of cultural and rotation practices that will reduce expense and at the same time stabilize production. Much has been accomplished along these lines, but much still remains to be done to obtain desirable types for all areas.

(e) COTTON AND OTHER FIBER CROPS AND DISEASES

Appropriation Act, 1936. . . . . $406,435
Budget Estimate, 1937. 406,435

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Cotton Investigations (Production, Improvement, and Diseases):			
General cotton breeding and improvement investigations	$68,977	$103,945	$103,945
Egyptian cotton breeding and improvement investigations	20,865	22,253	22,253
Sea Island cotton breeding and improvement investigations	2,000	15,000	15,000
Cotton genetic investigations	16,960	54,000	54,000
Cotton growth and developmental studies, including morphological and anatomical investigations	3,035	9,300	9,300
Cotton plant physiology investigations	6,000	66,000	66,000
Cotton disease investigations	20,375	28,000	28,000
Cotton quality research from the standpoint of production	10,000	40,000	40,000
Cotton culture investigations	6,785	9,200	9,200
Investigations on establishing improved cotton seed stocks, including one-variety method	25,954	40,000	40,000
Total, Cotton Investigations	180,951	387,698	387,698
Fiber Plants other than Cotton, Investigations of:			
Hard fiber studies	7,940	8,200	8,200
Fiber flax agronomic and breeding investigations	4,375	4,800	4,800
Hemp investigations	5,424	5,737	5,737
Total, Fiber Plants other than Cotton, Investigations of	17,739	18,737	18,737
Total obligations	198,690	406,435	406,435
Unobligated:			
Legislative impoundments	744	- - -	- - -
Other amounts unobligated	301	- - -	- - -
Total	199,735	406,435	406,435

CHANGE IN LANGUAGE

It is recommended that the language of the appropriation be changed by removing the proviso for the expenditure of $15,000 on Sea Island cotton experiments. This proviso makes necessary an expenditure far in excess of what might reasonably be expended on this crop. It is planned to continue the investigations of Sea Island cotton as a part of the general cotton breeding and improvement program, but the removal of the proviso requiring the spending of a specific amount for Sea Island cotton work is recommended in the interest of more effective use of the money appropriated.

WORK DONE UNDER THIS APPROPRIATION

General.--The work done under this appropriation consists of the investigation of cultural practices for growing cotton; the breeding of superior varieties of cotton, including Egyptian and Sea Island; study of the effect of soil, climate, and other factors on the yield, quality, and values of cotton fiber; study of chemical, physical, and other properties of cotton fibers which determine values for specified uses and the measurement of probable values by means of these properties; investigation of cotton diseases and their control, including breeding for disease resistance; utilization and maintenance of superior strains of cotton through the organization of single-variety communities; and investigation of hemp and flax fiber production and of hard fibers and other fibers used for ropes, twines, etc. This work is conducted in cooperation with the Bureaus of Agricultural Economics, Agricultural Engineering, Entomology and Plant Quarantine, Chemistry and Soils, with the State agricultural experiment stations and extension services, and with certain counties and group organizations.

Cotton Production, Improvement, and Diseases.--The work under this project consists of breeding operations to develop strains and types of cotton superior in yield and in lint character and resistant to climatic and other factors reducing yield and quality. It also includes studies of the relation of climatic and other factors to fiber yield and quality and of means of measuring quality factors so that new cottons being developed may be tested for quality before distribution. It likewise includes studies on cotton diseases and their control and of all other factors having to do with growing satisfactory yields of high-quality cotton.

Cotton is the bread-and-butter cash crop of the entire cotton-producing area. The crop also is of primary importance in domestic commerce and manufacture, six million 500-pound bales, in round numbers, being the normal domestic consumption, and is the country's principal agricultural export product. The 1935 crop occupies about 29,000,000 acres and in the past has totaled in excess of 40,000,000 acres. The 1934 cotton crop, including the value of the lint and seed, was worth in excess of $750,000,000. Intensive research on cotton is justified by its importance in the livelihood of such a large part of our population; by the necessity of improving and maintaining the improvement of American cotton in order to hold the export market in the face of an aggressive competition from high quality foreign production; and by the necessity for stabilizing production and for reducing production costs through removal of hazards caused by low quality, poor producing strains, diseases, faulty cultural practices, etc.

Fiber Plants Other Than Cotton.--Work under this project includes the investigation of hemp and flax fiber production in the United States and of hard fibers such as abaca (Manila hemp), maguey, sisal, and henequen in the tropics; and all plant fibers, except cotton, used for ropes, twines, yarns, woven fabrics, hats, matting, and stuffing or filling.

Flax fiber production is now established as a profitable crop in Oregon, and experiments of the pest two years indicate that this industry may be revived in certain areas in the East. An increase of more than 500 percent in the hemp acreage in this country shows increased interest in this crop. There is need for continued plant breeding of both fiber flax and hemp and further experimental work with relation to soil types and agronomic practices in growing these crops and preparing the fibers. Hard fibers, produced only in the tropics, are necessary for bindertwine and all high-grade cordage. It is important that coordination be kept up between twine and cordage manufacturers in this country and fiber producers in the tropics and that standards of fiber quality be maintained.

(f) DRUG AND RELATED PLANTS

Appropriation Act, 1936.	$47,139
Budget Estimate, 1937.	47,139

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Drug, Poisonous, insecticide, oil, and related plant investigations.....	$25,826	$36,279	$36,279
Hop production and diseases.....	8,668	10,860	10,860
Total obligations.....	34,494	47,139	47,139
Unobligated:			
Legislative impoundments.....	50	- - -	- - -
Other amounts unobligated.....	1,229	- - -	- - -
Total.....	35,773	47,139	47,139

WORK DONE UNDER THIS APPROPRIATION

General.--The work under this appropriation consists of investigations of plants yielding drugs, poisons, insecticides, essential oils, drying oils and perfumes with respect to their culture, their constituents and their possibilities as crops in the United States, also studies on hop production with particular reference to the improvement of the quality of domestic hops and to the control of the downy mildew through field practices and the development of new resistant varieties.

Drug, Poisonous, Insecticide, Oil, and Related Plant Investigations.--Plants that are important sources of products used in the manufacture of medicines, pharmaceuticals, flavoring materials, perfumes, insecticides, paints and varnishes, and related commodities are grown experimentally to determine their cultural requirements, the proper methods of handling, the methods of obtaining the commercial products from them, their qualities under various conditions, and the cost of their production as a basis for their introduction into American agriculture.

This country is dependent upon foreign countries for most of the above products. In some cases such sources are not available during extensive world disturbances. Their domestic production insures a more steady supply and better quality for the consuming industries, and the growing of the plants producing them provides non-competitive cash crops for farmers to turn to in favorable localities during periods of staple crop surpluses. In view of the fact that farmers are entirely unacquainted with the special requirements of such plants, much information must be obtained by preliminary investigations to provide the necessary background for their commercial introduction. This is primarily the objective of this project.

Hop Production and Diseases.--Under this project hop growers are assisted along two lines: The relationship of various projection factors to the brewing qualities of hops are studied as a means of bringing about a general improvement in the quality and uniformity of domestic hops, and growers are advised regarding cultural practices that reduce the spread of downy mildew and other diseases and instructed in the use of fungicide sprays and dusts to control the losses while a more permanent solution is sought through the development of new varieties with good commercial qualities and resistant to the disease.

The brewing industry is dependent almost entirely on the Pacific Coast States for its supply of hops. A permanent improvement in the uniformity and quality of the crop would enable growers to meet to a greater degree the competition with foreign hops. Unless the downy mildew is effectively controlled or resistant varieties provided, hop-growing may have to be abandoned in many localities where it is now an important industry. Aside from the economic loss suffered by the established growers, the resultant shortage would necessitate more extensive use of the more expensive foreign hops, with a corresponding increase in the cost of brewing.

(g) DRY LAND AGRICULTURE

Appropriation Act, 1936. . . . . $215,578
Budget Estimate, 1937. 215,578

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Dry-land agriculture investigations	$207,889	$215,578	$215,578
Unobligated:			
Legislative impoundments.....	175	- - -	- - -
Other amounts unobligated.....	772	- - -	- - -
Total.....	208,836	215,578	215,578

WORK DONE UNDER THIS APPROPRIATION

General.--Under this appropriation the problems of agricultural and horticultural development of the Great Plains and intermountain areas, a region classed as semi-arid, are studied at field stations to obtain the fullest possible information concerning soil and climatic conditions throughout the region and the agricultural effectiveness of each of the many different methods of tillage and crop rotations that can be considered as more or less suitable for this region where irrigation is not available.

Field stations are maintained at Akron, Colo., Tucumcari, N.Mex., Mandan, N.Dak., Lawton, Okla., Woodward, Okla., Big Spring, Tex., Dalhart, Tex., and Sheridan, Wyo.

Investigations are conducted at stations maintained by the Division of Western Irrigation Agriculture, Bureau of Plant Industry, at Huntley, Montana and Newell, South Dakota.

Investigations are conducted in cooperation with States at State stations located at Colby, Kans., Garden City, Kans., Moccasin, Mont., Dickinson, N. Dak., Archer, Wyo., Hays, Kans., Havre, Mont., North Platte, Nebr., and Pendleton, Oreg.

Dry-land agriculture investigations are conducted under three main activities, as follows:

(a) Dry-land field crop production investigations.--The work under this project consists of rotation and tillage experiments with cereal crops, forage crops, and cotton, as well as studies of pasture conservation and development, under dry-land conditions in the Great Plains area. (The Bureau of Animal Industry cooperates with livestock experiments at Big Spring, Texas). Crop rotation, cultural methods, and pasture practices are concerned not only with the immediate effects, but with the cumulative effects, in increasing, maintaining, or decreasing the productivity of the soil.

(b) Dry-land fruit and vegetable production investigations.--The work under this project consists of demonstrations of the feasibility of growing in this semi-arid region certain fruits and vegetables which can be produced on a home-garden scale.

(c) Cooperative shelterbelt demonstrations and experimental test plantings.--Under this project trees and ornamental plants that can be grown in dry regions are propagated and placed with experimenters for testing, and demonstrations of trees planted as shelterbelts are developed and encouraged. The dry lands naturally are treeless regions, but gratifying success has attended systematic effort to determine the kinds of trees and methods of care and culture necessary to their successful growth for shade and shelter.

(h) EXPERIMENTAL GREENHOUSE MAINTENANCE

Appropriation Act, 1936.	$78,632
Budget Estimate, 1937.	78,632

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Maintenance and operation of Experimental Greenhouses and adjacent experimental grounds and plots.....	$75,486	$78,632	$78,632
Unobligated:			
Legislative impoundments.....	239	- - -	- - -
Other amounts unobligated.....	245	- - -	- - -
Total.....	75,970	78,632	78,632

WORK DONE UNDER THIS APPROPRIATION

A range of thirty-two greenhouses, supplemented by a small adjacent outdoor area, is maintained, providing for experimental work with a wide range of plants. The greenhouses are operated to furnish necessary experimental facilities to the several appropriation items, particularly those dealing with the diseases of plants caused by bacteria, fungi, or nemas. Maintenance of experimental plants for hybridization or other plant-breeding or plant-physiological studies are also provided for.

(i) FORAGE CROPS AND DISEASES

Appropriation Act, 1936.....	$290,346
Allotment from "Experiments in Livestock Production in Southern United States" (Miscellaneous).....	+ 3,645
Allotment to "Cereal Crops and Diseases" (for forage sorghum investigations).....	-3,798
Total available, 1936.....	290,193
Budget Estimate, 1937.....	300,193
Increase.....	10,000

Note: The foregoing allotments are carried forward by means of transfers in the estimates for 1937.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
Alfalfa Investigations....	$58,315	$49,000	$59,000	+ $10,000 (1)
Clover investigations.....	22,832	29,048	29,048	- - -
Soybean and cowpea investigations.....	18,300	19,500	19,500	- - -
Lespedeza and other acid-tolerant legume investigations.....	34,575	40,000	40,000	- - -
Grass and pasture investigations.....	50,473	152,645	152,645	- - -
Total obligations.....	184,395	290,193	300,193	+ 10,000
Unobligated:				
Legislative impoundments...	175	- - -	- - -	- - -
Other amounts unobligated..	666	- - -	- - -	- - -
Total.....	185,236	290,193	300,193	+ 10,000 (1)

(1) An increase of $10,000 in the project "Alfalfa Investigations". Alfalfa is the most important hay plant west of the Mississippi and is assuming a place of greater importance as a hay and pasture crop in some areas east of the Mississippi. Production of alfalfa in the West, however, is menaced by a disease known as bacterial wilt. In the East other diseases may limit production. These problems, among others, including cold injury, emphasize the need for varieties and regional strains of alfalfa possessing special adaptations to satisfy cultural requirements in various parts of the United States. The results of studies in progress show that the establishment of wilt-resistance in improved strains of alfalfa is possible and that this prospect offers the greatest hope of overcoming the ravages of bacterial wilt which at present

cuts the life of alfalfa from ten to three years, entailing heavy losses to producers. Wilt-resistance in a strain, however, does not insure that strain against other diseases or cold injury. The latter problems are distinct and demand special consideration from the standpoint of plant breeding and from that of cultural control. Solution of these and related problems is complicated by the fact that much of the alfalfa seed consumed in eastern areas is produced in distant western areas. This fact makes necessary the fullest possible coordination of seed-production with seed-consumption requirements. The possibilities of local seed production in eastern areas should also be fully explored. It is planned to expand tests for alfalfa breeding and improvement investigations for winter hardiness under controlled temperatures; to further test surviving strains under a wide range of natural conditions after artificially inoculating seedlings with the organism of bacterial wilt; to increase seed supplies for further test in wilt and non-wilt areas; and to determine relative resistance to cold, disease, and other injury, taking full account of both hay and seed producing values. Investigations would be conducted to expand cytological, pathological, and physiological studies of the mode of inheritance of disease resistance in alfalfa and of the nature of resistance in the case of each disease studied. The proposed expansion of investigations under this project would be effected in cooperation with State agricultural experiment stations and other agencies.

WORK DONE UNDER THIS APPROPRIATION

General.--Research under this appropriation includes studies in the production and improvement of plants used for hay and pasturage and in lawns, parks, airports, and fine turfs; the control of diseases of these plants; determination of their relative hay, pasture, and turf values, their habits of growth, mode of inheritance, seeding habits, and the possibility of their economic utilization. These studies are made under the following projects:

Alfalfa Investigations.--The purpose of this project is to study existing species and varieties of alfalfa which have been assembled from both foreign and domestic sources, with a view to selecting and breeding varieties specially suited to various soil and climatic conditions; study the diseases of alfalfa and effective control measures, through breeding or otherwise; and improve cultural practices as a means of rendering production as stable and profitable as possible. Species, varieties, and regional strains of alfalfa from common sources of seed are compared in a number of different regions throughout the United States. Relative winter hardiness and disease resistance are determined, hay and seed values measured, and factors influencing seed-setting studied. Breeding technique is employed to effect improvement in hay and seed production, as well as resistance to cold and disease. Cultural studies are undertaken to solve problems arising from specific conditions. Drought, cold, disease, and other factors which periodically limit alfalfa production in various parts of the United States may be met most effectively through the use of farm practice of varieties and methods of culture specially adapted to specific soil and climatic requirements. Hardiness in alfalfa is sought by all growers, and the results of current research indicate the possibility of making available varieties and strains possessing unusual hardiness as measured by relative resistance to cold and disease, particularly bacterial wilt--a disease which reduces the life of alfalfa from ten to three years and necessitates special cultural practices. The importance of alfalfa

as a farm crop justifies not only continuation but substantial expansion of this research.

Clover Investigations.--The object of this project is to study causes of clover failure; introduce into agricultural use new species and varieties; study the diseases of clover, cultural factors, and the possibility of breeding improved varieties. The work involves the testing of all available species, varieties, and regional strains at different field stations under widely varying environments; maintenance of nurseries of red, sweet, and other clovers for observation and as sources of breeding material; cultural experiments, disease studies, and development of breeding technique to secure varieties resistant to disease and winter-killing. Clover still constitutes the basis of good crop-rotation systems in a number of important agricultural areas of the United States. In these areas their culture is fundamental in soil conservation and livestock production. The frequent failures of red clover and cultural difficulties with sweet clover make it necessary to continue the study of factors controlling the successful production of these important crops. The problem of retaining white and other clovers in pasture mixtures with grasses is of particular importance at this time and is commanding widespread attention. Strains of red clover far superior to common strains have been isolated, and their perfection and establishment in farm practice would reduce losses now incurred by farmers through clover failures. Comparable progress is being made with sweet clover in Western States and with white clovers in Northeastern States.

Soybean and Cowpea Investigations.--This project aims to improve varieties now being grown in soybean producing regions and to find improved varieties for regions now lacking suitable varieties for forage, green manure, pasturage, and seed in the oil and food industries, with special attention to oil and protein content, nutritive value, grain yield, and quality of beans; to develop better varieties of cowpeas, especially of disease-resistant types, suitable for food, forage, and soil-improvement purposes; to test numerous introductions and selections in various parts of the United States, in cooperation with Federal and State experiment stations; to study adaptations of soybean varieties and selections and compare their values for forage, food, and industrial purposes; to study cowpea varieties from the standpoint of forage and seed types and their resistance to wilt and nematode injury. A ten-fold increase in the total acreage of soybeans in the United States between 1925 and 1935 brought this crop to a position of major importance industrially as well as agriculturally. Its use as a forage plant will continue and probably greatly extend, and with the rapid development of the soybean oil and food industries a considerably increased acreage for seed production may be expected.

There are more than 30 oil mills and food factories in the United States which have a crushing capacity of 10,000,000 bushels of soybeans annually. The seed crop alone in 1934 was valued at $24,000,000, and this is estimated as representing about one-fourth of the total value of the soybean crop in that year. Soybeans are very susceptible to soil and climatic influence, and there is need for continued research to satisfy both agricultural and industrial demands for superior varieties. There is a proportionate need for studies with cowpeas, which will continue to be one of the most important leguminous crops in the Southern States. The cowpea seed crop of 1934 totaled 5,296,000 bushels, with a value of $8,791,420.

Lespedeza and Other Acid-Tolerant Legume Investigations.--The object of this work is to determine the best species and varieties of vetches and other winter legumes and of Lespedezas and Crotalarias, leading summer cover crops; to study cultural problems and methods of utilization in soil conservation, forage, and other uses; to select improved varieties, study seed-supply problems, and try to develop disease-control measures; to test seed of all available species and varieties at appropriate field stations, and determine best methods of production and utilization. By far the greatest part of the land south of the Ohio and Potomac Rivers and from the Atlantic Ocean to the Ozarks consists of acid soils. On these soils alfalfa and clover cannot be grown without excessive liming, at prohibitive cost. The need of finding acid-tolerant crops which will grow on these soils and thereby aid in soil conservation, and at the same time furnish forage, is imperative. The Bureau of Plant Industry already has introduced one Lespedeza so well suited to soil and climatic conditions in the region described that in ten years the acreage has increased from nothing to 7,000,000 acres. Continued shifts in agriculture, calling for summer pasturage, will result in extended use of these crops. In the meantime, some winter acid-tolerant legumes, as Austrian peas, are being limited by disease, and the problem of developing varieties resistant to disease has arisen to demand active interest on the part of plant breeders and pathologists.

Grass and Pasture Investigations.--This project includes the test of introduced and native species and the selection and breeding of superior varieties and regional strains for use as hay or pasturage or in fine turfs; study of the reaction of grasses to various environmental factors and different intensities of use; study of growth and fruiting habits of grasses as a means to insuring full utilization and adequate seed production; development of disease control measures; comparison of species and varieties under field conditions in various parts of the United States; selection of superior strains of different types and their study with reference to self-sterility or self-fertility, life history, and seeding habits; further improvement through hybridization; development of methods designed to insure seed supplies of the more promising strains; cultural tests to determine suitable methods of seedling and establishing turfs and of maintaining them under use, free from weeds and diseases. Over one-half of the total land area of the United States is utilized in some degree as pasturage. Grasses are the foundation of practically all pasture flora and, in addition, they contribute over one-third of the hay produced in the United States. Their high value as soil cover in soil erosion control is generally recognized, as is their importance in lawns and fine turfs for ornamental and recreational use or for the protection and beautification of highways and railroad right-of-ways. Major adjustments in agricultural practice in the interest of soil conservation and for other reasons are calling for still wider use of grasses, and it is likely that an urgent demand for information pertaining to them will persist indefinitely. Yet, with no other forage plants is there a greater lack of definite information on species, varieties, possibility of improvement, and use. The greatest possible use of grasses will not be realized until knowledge concerning these important forage plants is increased to a point where it will be as intimate and comprehensive as present knowledge of corn and other cereals.

(j) FOREST PATHOLOGY

Appropriation Act, 1936. . . . .$252,092
Budget Estimate, 1937. 252,092

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Diseases of forest trees and forest products, investigations of.....	$124,639	$127,357	$127,357
Diseases of shade trees, shrubs, and chestnut orchards, investigations of..	51,323	51,716	51,716
Epidemic tree diseases, investigations of.....	68,429	73,019	73,019
Total obligations.....	244,391	252,092	252,092
Unobligated:			
Legislative impoundments.....	200	- - -	- - -
Other amounts unobligated.....	4,799	- - -	- - -
Total.....	249,390	252,092	252,092

WORK DONE UNDER THIS APPROPRIATION

General.--Under this appropriation investigations are conducted on the diseases of forest trees, shade trees, and shrubs, with particular reference to control methods; also studies on the decay and discoloration of logs, lumber, pulpwood, posts, and other forest products. The same organisms frequently cause diseases of both forest and shade trees, and some of the fungi found in structural timber may also cause losses in standing trees. The National Government, in its Forest and Park services, directly controls large forest areas; hence these investigations are of direct service to the Government in the administration of its own properties in addition to their value to private wood producers and wood users. The State agricultural experiment stations are paying relatively little attention to forest and shade tree diseases. The extensive development in forestry during the present Administration, including such activities as the soil-erosion work, enlargement of national forests in the East, and shelterbelt planting in the Great Plains, State and Government civilian conservation camp work, and the Tennessee Valley development, have all placed increasing demands on the services of the pathologists of this Division.

Tree-disease work, in cooperation with the U. S. Forest Service and in some cases with State agencies, is conducted at the following points: San Francisco, Calif.; New Haven, Conn.; New Orleans, La.; Albuquerque, N.M.; Portland, Oreg.; Philadelphia, Pa.; and Madison, Wis. Work on the Dutch elm

disease is conducted at the cooperative field stations at Morristown, N.J., and Wooster, Ohio. The major portion of the shade-tree work is centered at New Haven, Conn., though each of the other branch offices does some work on this general problem with particular reference to the surrounding region.

Diseases of Forest Trees and Forest Products.--Work under this project, carried on mainly at the experiment stations of the U. S. Forest Service, consists of investigations of the native diseases attacking forest nursery stock, plantations, and standing trees in the forest, as well as the fungous discolorations and decays of logs, lumber, etc., and is part of the program authorized by the McNary-McSweeney Act. Research on the long-introduced diseases, chestnut blight and white-pine blister rust, is also included, forming a basis for the development of resistant forest chestnuts and for the local control of the rust.

The management of Government, State, and private forests on a profitable basis depends upon the prevention of loss from disease and decay. Because of the long life of forest trees, study of these diseases must be continuous over a period of years. A new method of approach to forest production has been developed, which considers the effect of diseases on the stand and the timber yield rather than on the individual tree and aims at preventing losses from native diseases through changes in the methods of forest management rather than by individual treatment. Investigation of fungous injury to forest products is under way, including a campaign against sap stain, for which the Southern lumbermen have been furnishing part of the funds, and to meet the demands for information by other groups of wood producers and consumers. The improved control methods developed in this work have already come into large-scale use and are resulting in better lumber for the domestic consumer as well as aiding Southern lumber to compete in the foreign market. Southwestern farmers have been aided in securing durable fence posts. A service of unique type has been rendered to forestry in the determination for several forest regions of the methods of logging slash disposal that favor most rapid decay and thus decrease of the fire hazard. (Forest Service, Bureau of Chemistry and Soils, and Bureau of Entomology and Plant Quarantine cooperating).

Diseases of Shade Trees, Shrubs, and Chestnut Orchards.--Street, park, and ornamental trees make up a material part of the wealth of this country. Intangible values, such as reduction of temperature in summer and the enhancement of the beauty of a place, are difficult to estimate. Losses of trees from diseases, unfavorable climatic factors, and decay of the heartwood, with resulting breakage, are taking place in every locality of the country. The primary object of the work under this project is the prevention and reduction of these losses. Most of the diseases have never been investigated and others have been only partially studied. Improved methods of tree repair and better wound dressings are being studied. However, a large part of the funds in this project is required to determine the diseases and answer the correspondence sent in by the general public.

The increased number of visitors in our national and State parks have created new problems, particularly with reference to the packing of soil around the more valuable trees and diseased conditions resulting. Many invaluable sites have already been severely injured. These problems and various others dealing with park conditions are being studied in cooperation with the National Park Service and some of the State parks.

The incipient chestnut-orchard industry in the East was wiped out by chestnut blight. Blight-resistant strains of chestnut introduced by this Bureau are being extensively tested as a basis for an orchard industry in the Eastern States. Among many thousands of seedlings, those in which resistance to the blight and root disease are combined with desirable horticultural qualities are being selected. Extensive breeding work to secure valuable hybrids is under way. As we normally import 20 to 25 million pounds of chestnuts from Europe, this is one agricultural industry that can be developed without danger of overproduction for many years. In the Western States, where the blight is not yet established, most of the planted chestnuts are blight susceptible, and efforts are being made to eradicate the few infections already found in that region and to put the industry on a basis of blight-resistant trees.

Epidemic Tree Diseases.--This project covers the investigation of diseases of forest and shade trees when they first appear in the United States. Knowledge of the causal agents and their behavior and the discovery of control methods may at that time make possible the ridding of the country of these diseases before they become established. Like the Red Cross, the work must meet the emergencies when they arise. The Dutch elm disease, discovered in a small way five years ago in Ohio and more recently in Maryland, Virginia, and Indiana, is now very serious around New York City, in New Jersey, New York, and Connecticut, where thousands of affected trees have been found. It threatens the life of the American elm. The investigations made under this project furnish the foundation for the joint Federal and State eradication campaign now under way. The European larch canker infection found in Massachusetts is important to the larch forests of the Northern and Western States. The cause and control of a canker disease of pitch pines is being studied. It is apparently serious on the slash pine of the Southeastern States, so important in turpentine production and of promise for the paper industry. The Woodgate rust, which occurs in New York State, is of danger to the pitch pine of the South and the Pacific Coast. An apparently threatening twig blight of the ponderosa pine in Arizona and New Mexico is being evaluated in its relation to that important pine. Willow scab is rapidly spreading over New England and southwesterly through New York and Pennsylvania, and bears on the use of willows in erosion control. (Bureau of Entomology and Plant Quarantine cooperating).

(k) FRUIT AND VEGETABLE CROPS AND DISEASES

Appropriation Act, 1936	$1,151,192
Allotment from "Forest Insects", Bureau of Entomology and Plant Quarantine (for Azalea flower blight work)	+ 600
Allotment to "Agricultural Chemical Investigations", Bureau of Chemistry and Soils (for fruit and vegetable utilization work)	- 36,338
Net available, 1936	1,115,454
Budget Estimate, 1937	1,140,454
Increase	25,000

Note.--The foregoing allotments are carried forward by means of transfers in the estimates for 1937.

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
Deciduous fruit investigations.	$246,275	$252,269	$277,269	+$25,000(1)
Citrus, avocado, and other subtropical fruit investigations.	96,874	109,539	109,539	---
Nut investigations	113,968	115,716	115,716	---
Vegetable investigations	189,457	208,093	208,093	---
Floricultural and ornamental horticultural plant investigations	67,209	70,288	70,288	---
Nursery stock and shelterbelt investigations	63,226	67,230	67,230	---
Potato investigations	67,237	78,634	78,634	---
Methods of handling, transportation, and storage, and market diseases of fruits, vegetables, and flowers, investigations of	153,588	169,485	169,485	---
Investigations of variety suitability and quality in relation to fruit and vegetable utilization	45,685	44,200	44,200	---
Total obligations	1,043,519	1,115,454	1,140,454	+ 25,000
Unobligated:				
Legislative impoundments	2,063	---	---	---
Other amounts unobligated	1,384	---	---	---
Total	1,046,966	1,115,454	1,140,454	+ 25,000(1)

(1) An increase of $25,000 in the project "Deciduous Fruit Investigations", for breeding of hardy, disease-resistant peaches, apples, pears, and grapes. There is a great need for a national fruit-breeding project organized in cooperation with the State agricultural experiment stations for the development of improved varieties of higher quality fruit resistant to diseases and low temperature. Since this is a long-time project affecting all parts of the country, the Government should take the lead in this important research. The production of good quality peaches, pears, grapes, and berries, particularly in sections of the United States east of the Rocky Mountains, is limited largely by the susceptibility of these fruits to diseases or by their lack of resistance to low winter temperatures. These crops over much of the territory are uncertain because of their sensibility to low winter temperatures. Good quality pear varieties cannot be grown in most sections because of susceptibility to fire blight. Grapes in the Southern States, with the exception of Muscadine varieties, are short-lived and poorly productive because of susceptibility to root rot, black rot, and mildew. Few raspberry varieties are sufficiently disease-resistant to grow south of the Potomac and Ohio Rivers and westward. Strawberries can be grown in the Gulf region only with expensive spraying treatments. The greatest opportunity for improving production of these fruit crops throughout the Eastern States is through an extensive program of breeding for increased disease resistance, increased hardiness, and improved quality. The Department's program of fruit breeding needs to be greatly expanded if the need of the industry for improved varieties is to be met.

WORK DONE UNDER THIS APPROPRIATION

General.--Under this appropriation investigations are conducted to determine the best methods of culture, propagation, breeding, selection, disease control, and related activities as affecting the most profitable production of high quality orchard fruits, small fruits, nuts, vegetables, ornamentals, nursery stocks, and related plants. The interrelation of various orchard management practices and problems concerned with the nutrition and physiology of the various horticultural plants are studied. Investigations for determining the best methods of harvesting, packing, shipping, storing, and utilizing horticultural products are also conducted, including the physiological and related changes of perishables during marketing and storage. In addition to cooperative activities with the State agricultural experiment stations, other bureaus of the Department of Agriculture and the Bureau of Indian Affairs of the Department of the Interior, field stations, laboratories, and offices are maintained at the following points:

Field Stations (Government-owned land)

Bellingham, Washington	Cheyenne, Wyoming	Meridan, Mississippi
Beltsville, Maryland	Fresno, California	Oakville, California
Brownwood, Texas	Indio, California	Robson, Louisiana

Field Stations (land furnished)

Austin, Texas	Florence, S. C.	Greeley, Colorado
Eustis, Florida	Fort Valley, Ga.	Palo Alto, California
		Philema, Georgia

Field Laboratories

Albany, Georgia	East Wareham, Mass.	Pemberton, New Jersey
Chadbourn, N. C.	Fayetteville, Ark.	Pomona, California
Charleston, S. C.	Hood River, Oregon	Shreveport, Louisiana
Chicago, Illinois	Los Angeles, Calif.	Springfield, Missouri
Chula Vista, Calif.	New York, New York	Vincennes, Indiana
Corvallis, Oregon	Orlando, Florida	Wenatchee, Washington
		Yakima, Washington

Field Offices

Riverside, California Sacramento, California

Deciduous Fruit Investigations.--Investigations cover production, breeding, and disease control for apples, pears, peaches, cherries, plums, apricots, grapes, raspberries, strawberries, cranberries, and other orchard and small fruits. The influence of pruning, fruit thinning, soil improvement crops, fertilizers, and other orchard management practices on yield, regularity of crops, and quality of fruit is studied; also the functioning of fruit trees under varying soil moisture conditions. Cultural methods for strawberries, including effects of different plant nutrients on production, firmness, and quality of the fruit, are under investigation. Best root stocks and varieties for grapes in the Southeast and in the vinifera grape regions, especially in California, are being determined. Through fruit breeding and bud selection studies with apples, pears, peaches, plums, grapes, raspberries, strawberries, cranberries, and other small fruits, improved varieties of high quality and disease resistance are being developed. Through introduction, selection, and breeding fruits are being developed that are adapted to withstand severe drought and cold conditions. Destructive fungous, bacterial, virus, and physiological diseases of all the more important kinds of deciduous fruits are studied for the purpose of determining their life histories, methods of dissemination, means of infection, and methods of control whether spraying, disinfection, fumigation, eradication, breeding of resistant varieties, or other means. Efforts are made to develop new sprays superior to those now generally in use in effectiveness and in freedom from causing injury to host plants.

These investigations are designed to determine methods of reducing the cost of production and at the same time to cause a more uniform and stable production of high quality fruit.

Immense investments are represented by the apple and other deciduous fruit industries. The production of apples varies from around 140,000,000 to more than 200,000,000 bushels annually, with a valuation ranging from about $100,000,000 to nearly $178,000,000, depending on crop and market conditions. The annual valuation of the peach crop formerly averaged around $60,000,000, though in recent years the average has been only about half that amount. The grape crop in recent years has had an average annual value of some $30,000,000; in former years the average was from two to three times as great. The strawberry crop in normal years has a farm value of $35,000,000 to $38,000,000. The farm value of the other deciduous fruits adds many more millions of dollars to the total. Annual losses due to the more prevalent fruit diseases have been estimated at about $50,000,000. Disastrously large proportions of fruit crops are frequently lost by growers, their income being

reduced proportionately. The development and use of suitable control methods would largely prevent such disasters and aid greatly in stabilizing yearly production--a factor of basic importance to the grower and consumer alike and to the fruit industry generally. One of the most serious handicaps to the farmer of fruit production is the wide fluctuation from year to year in size of the crop and its cash return. The orchard management studies are projected with a view to inducing regular annual crops of high quality. Specific methods, often quite different, must be developed because of the different regional conditions under which fruit is grown. Most fruit varieties in cultivation originated as chance seedlings; many of them are faulty in various ways. Fruit breeding is conducted to develop disease-resistant varieties having better eating quality and varieties better adapted to various local conditions and having superior merit for shipping, storing, canning, drying, or preservation by other methods. The bud selection work accomplishes similar results by taking advantage of bud mutations as they occur in nature. These lines of investigations are for the purpose of aiding fruit growers in the solution of problems which seriously reduce net income and which as individuals they are not in a position to solve.

Citrus, Avocado, and Other Subtropical Fruit Investigations.-- Efforts are being made through breeding and bud selection methods to develop improved citrus varieties resistant to disease and capable of producing more regular and profitable yields. More satisfactory root-stocks are being sought and the effects of pruning, soil management, fertilization, and leaf area on the yield, texture, storage, and shipping quality are being determined. Especial attention is being given to all production problems concerned in growing Satsuma oranges in the Gulf States. Variety studies, studies of pollination, pruning, and soil management requirements, breeding and propagation investigations, and studies of factors affecting quality are being conducted with dates, avocados, mangoes, figs, and other subtropical fruits. Diseases of citrus and other subtropical fruits are studied to determine their causes, methods of dissemination and infection, effects on the host plants, and the most effective and practical means of prevention or control.

For the years 1931-34 the average farm value of citrus fruits was about $98,000,000. The corresponding figure for the former years of 1928-29 was $162,300,000. The average annual production of avocados for the 5-year period 1928 to 1932 was 2,156 tons, having an average farm value of $518,000. The date crop amounts to about 5,500,000 pounds annually and is increasing. Similar figures for the mango and other subtropical fruits are not available. Certain of these fruits, such as the date, can be grown successfully in many of the hot interior valleys of the Southwest and will furnish a profitable crop for such regions if their cultural requirements can be determined. Avocados and citrus fruits furnish profitable crops for many of the Western and Southern States.

Nut Investigations.-- The work varies widely with the kind of nut and region where grown. Merits of almond varieties are determined and improved varieties are being developed by breeding. Cultural requirements of the pecan to induce regular annual crops of well-filled nuts are being investigated. Habits of blossoming and pollination requirements of Persian walnut varieties as influencing yields are determined. Those conditions most favorable to growth and production of filberts are being studied. Merits, range of

adaptability, and possibilities of black walnuts, various hickories, chestnuts, hazels, and other nuts are studied. The breeding and selection of improved varieties of filberts, walnuts, and other nuts are in progress. Serious diseases of pecans, walnuts, filberts, and tung nuts are being studied to determine their nature, modes of spread, and development, and effective and economical methods of prevention or control.

The average production of almonds in California for 1931-34 was 13,200 tons, average value $2,300,000; Persian walnuts 38,500 tons, average value over $8,200,000; value of filberts in Oregon has ranged in the same period from $85,000 to $300,000 a year. Pecans, representing the one native nut of primany importance, averaged a yield of about 64,000,000 pounds for the years 1931-33, with a range in valuation of from nearly $3,000,000 to more than $6,000,000 per year. The value of nuts for food purposes is generally recognized. Serious production problems exist with each crop. Many almond varieties of inferior value have greatly handicapped merchandizing the crop. Varietal studies have helped to determine those to discard. The need of improved varieties has been partially met in breeding work that is in progress. The pecan is a native nut only comparatively recently brought into cultivation in orchard form. Cultural requirements are largely unknown. Irregular and small crops of poorly filled nuts are disastrously frequent. Cultural methods that will overcome these difficulties must be determined if the pecan industry is to succeed. Many Persian walnut orchards have habitually been unproductive. The determination of cross-pollination requirements of the varieties has shown that such orchards may be made more productive and profitable when suitable cross-pollination is provided. Widespread interest prevails in the various hickories, black walnuts, butternuts, hazels, and other nuts suitable for growing in Northeastern United States. Collections are being made throughout the country of as many desirable wild seedlings as can be found, and these should be grown under uniform conditions to determine the value from the standpoint of quick growth, disease resistance, and uniform yields of high quality nuts. Considerable plantings of tung nut trees have been made in recent years in the southern coastal plain region for the commercial production of tung oil which is imported to the amount of about 100,000,000 pounds annually and extensively used in varnish manufacture and for other industrial purposes. The culture of this tree, new to North America, presents many problems in propagation, cultural requirements, orchard management, varietal selection and breeding, and disease control.

Vegetable Investigations.-- These activities include studies of improved methods of handling seed, production of plants in plant beds, and establishing field plantings; studies of the adaptability of specific crops and varieties to different regions as affected by water supply, temperature, and other meterological factors; the causes and control of numerous non-parasitic diseases or abnormal growth and development troubles of vegetable crops; the study of fungus, virus, and bacterial diseases, their life histories, modes of dissemination and infection, and methods of control or prevention; the factors determining high culinary and market quality in vegetable products and methods of their control; the breeding and selection of disease-resistant vegetable varieties of improved culinary and market quality to meet specific market, shipping, or manufacturing requirements; the establishment of nationally applicable standards and descriptions of commercially important varieties. Cultural, varietal and breeding investigations are made in relation to the successful production of vegetable

crops under the drought and low temperature conditions of the Great Plains area. Special breeding or selection investigations for disease resistance are being conducted with lettuce, muskmelon, and peas in California; celery in Florida; tomatoes in Florida, Utah, and California; peas and beans in Colorado, Washington, Idaho, and Oregon; cabbage in Wisconsin; potatoes in Maine, Minnesota, Michigan, Iowa, North Dakota, Louisiana, Maryland, and other States; and sweet potatoes in Mississippi, Virginia, and Maryland.

According to the 1930 Census and data of the Department of Agriculture, the total farm value of the crops receiving consideration in this project was about $800,000,000 in 1929. On account of recent low prices in the past few years, the total value of these crops is now far less. Losses from disease in the more important vegetables other than potatoes are estimated to amount to something like $84,000,000 annually. The estimated loss from potato disease alone is about $45,000,000, making a total estimated annual loss from diseases of $129,000,000. Much of this loss could be prevented if new spray materials and spraying methods could be developed. If disease-resistant varieties of high quality could be developed by breeding, great savings would result. Vegetable disease control is basic to stabilized production.

Floricultural and Ornamental Horticultural Plant Investigations.-- Experiments with tulips, hyacinths, daffodils, lilies, and other bulbous flowering plants are conducted. The work includes a study of cultural methods and the effects of different storage conditions and handling methods on subsequent growth and flowering, the object being to regulate at will the time of flowering by appropriate treatment. Breeding and selection to develop improved types and varieties and the development of information regarding various new or little known bulbous flowering species and types that possess potential commercial value are important phases of these investigations. Investigations are made to determine the value of different varieties of various groups of ornamental plants, including annuals, herbaceous perennials, roses, and other hardy plants and trees to determine their suitability for different uses and their adaptability to different climatic and other conditions. The arrangement of plant material for ornamenting home grounds and public buildings is studied, and the selction and use of plants and trees for park and roadside planting, and for farm homestead improvement are receiving attention. Investigations are conducted on important diseases of roses, azaleas, boxwood, and other ornamental shrubs, florists' stocks, and flowering bulbs, with a view to determining the cause, means of spread, conditions influencing outbreaks, and methods of satisfactory control or prevention.

In a large measure the object of bulb culture investigations is the establishment in suitable regions of an American bulb production industry in place of importing the supply used by American planters. This is true particularly of the commonly designated "Dutch bulbs." In 1929 there were imported into this country 235,000,000 to 250,000,000 bulbs, including hyacinths, tulips, daffodils, crocus, lily, and other commonly grown stocks. The value was nearly $7,000,000. In 1932 the importation of the same items was 140,000,000 to 150,000,000 bulbs, with a value of about $2,260,000. Many American growers, largely as a result of these investigations, are now producing supplies of bulbs formerly imported. The importation of certain stocks is now restricted because of quarantine regulations. In these investigations methods are being developed that greatly simplify cultural practices and reduce cost of production.

By use of special methods of storing and handling, practices are being originated so that florists may secure blossoms of iris and daffodils several weeks in advance of the usual time of blooming and at periods when good demand for them can readily be developed. This greatly extends the "forcing season" for these items, and at little or no added expense to the growers. More than 100 lily progenies from breeding work are being developed. Several lily hybrid selections of much promise and representing new types have been brought to the stage of introduction. These and other investigations of great potential promise to the industries are in progress.

With the expanding interest in recent years in the growing of ornamental plants disease problems began to multiply, with corresponding demands made of the Department for help. Because of the universal interest in an extensive planting of roses and the sericusness of certain diseases, particular attention has been directed to them with a view to finding effective and practicable means of control. A similar situation prevails with respect to bulbs, lilies, and ornamental plantings. The work is directed to particular disease troubles that cause serious loss to the producers of particular kinds of florists' and ornamental stocks as well as to the purchasers and planters. There are no complete figures available on the loss due to diseases of ornamental plants. An estimate has been made of $2,500,000 annually due to diseases of greenhouse roses alone. The continuance of certain famous azalea gardens and boxwood plantings in the South is apparently contingent on the development of a satisfactory means of controlling very serious diseases that have recently attacked them.

The 1930 Census report shows that in 1929 nursery sales included about 110,000,000 specimens of ornamental trees, shrubs, and other similar plants (not counting annuals, bulbs, and herbaceous plants). On April 1, 1930, there were growing in the nurseries of the United States, for further development and future sale, about 340,000,000 specimens of the same items. The sales of florists' stocks, roses, carnations, and the like, grown in greenhouses and in the open during 1929, amounted to more than $98,000,000. The study of this type of material to determine varietal merit and effectiveness and adaptability to different conditions and uses is necessary in order to supply information constantly and increasingly in demand by the public; also to determine best methods of culture, including pruning, fertilizing, and general care. The development by selection of improved varieties, particularly of hardy chrysanthemums, to provide early and desirable flowering types for regions where the growing season is comparatively short is yielding results of large potential importance.

Nursery Stock and Shelterbelt Investigations.-- Selecting and determining the merits, both from the nurseryman's and the fruit grower's point of view, of different root stocks for use in propagating apple, pear, peach, plum, and cherry trees are being investigated. Suitable vigorous and disease-resistant root stocks for outdoor hybrid tea roses and for use in propagating rose plants for greenhouse forcing are being studied. Studies are being made of the propagation of other ornamentals, including also the propagation of fruit and rose stocks from seed, and by grafting, layering, and cuttings. Experiments in the proper storage of nursery stock to determine optimum moisture and temperature conditions for best results are being made. Investigations are made of crown gall and other diseases of nursery stock and of various root diseases of fruit

trees, with a view to determining their cause, the factors influencing their development, and the best means of prevention or control. Investigations are made relative to the best species of trees to use for shelterbelts, both under dry and irrigated conditions in the Great Plains area, the best methods of planting and tree arrangement from the standpoint of checking wind velocity and snow drift, and the relation of the shelterbelt to the prevention of soil blowing and the retention of moisture.

Nursery sales during 1929, according to the 1930 Census report, involved approximately 186,000,000 trees, shrubs, and other plants (excluding strawberry and other berry plants). As of April 1, 1930, the nurserymen had growing for further development and future sales nearly 490,000,000 of the same items. The value of the sales in 1929 amounted to about $95,000,000. Relatively little research work for the benefit of the nursery industry has been done in this country. Many of the problems concerning suitable understocks, methods of propagation, and the winter storage of nursery stock remain unsolved. An understock may lack hardiness, or congeniality with the variety grafted on it, or it may lack insect or disease resistance, or adaptability to soil conditions, or in other ways it may lack qualities necessary to make it of permanent value to the planter. Great losses to both nurserymen and fruit growers have occurred in the past from the use of unsuitable root stocks. More rapid, less tedious and less costly methods of propagating certain kinds of stocks are needed. Heavy losses from the destructive effects of improper storage conditions during winter are often suffered. Research on storage conditions for optimum results should save many thousands of dollars in such losses. Improvements in methods of disease control will prevent large losses and have a stabilizing effect on the industry. The best selection and proper arrangement of trees for shelterbelt planting in the Great Plains area should result in a more profitable agriculture and better and more pleasant surroundings in which to live. While living conditions in this area should be made much more pleasant, the effect on conditions of crop production should result in greatly increased financial returns to the owners.

Potato Investigations.-- The investigations fall mainly into three groups: (1) Breeding and selection to develop new varieties that possess superior table quality, better adaptability to diverse soil climatic and other conditions, and resistance to disease; (2) cultural methods, including storing and handling of seed stocks to obtain optimum results; and (3) studies of the fungous, bacterial, virus, and physiological diseases of potatoes, their causes, modes of spread, effects on the plant, conditions influencing outbreaks, and methods of control or prevention. Breeding and selection work is carried on cooperatively in important potato producing States - Maine, Virginia, Maryland, North Carolina, New York, Michigan, Iowa, Minnesota, and others. Cultural investigations are conducted to determine the most profitable quantity of seed to use; time of cutting seed, and manner of handling thereafter; best methods of planting; most efficient use of fertilizers; amount of irrigation necessary in different regions; and effect on results of storing seed stocks at different temperatures and humidities.

The average farm value of the potato crop for the past five years has been about $266,000,000. In some years the value is as much as $477,000,000. The potato crop is vastly important to the farmer; it is the most important vegetable

crop to the consumer based on volume used. Though extensive commercial production is restricted to perhaps a dozen States, the potato is the most universally grown of all vegetable crops. Problems of production are as varied as the diverse conditions under which the crop is grown. Low yields per unit of land prevail generally. Stabilization of production through greatly increased yields per unit of land, thus reducing acreage and lessening costs of production; better handling of seed stocks; and the development of varieties of superior quality and resistant to disease are some of the principal means of bettering the potato industry, and particularly the producer. The estimated loss from potato diseases is about $45,000,000 annually, and any improvement in efficiency or economy of control measures would result in large financial savings.

Methods of Handling, Transportation, and Storage, and Market Diseases of Fruits, Vegetables, and Flowers.-- Experiments are conducted to determine the most effective methods of cooling and refrigerating fruits and vegetables in transit; best methods of car heating to prevent freezing while in transit during extremely cold weather; methods of controlling diseases of fruits and vegetables in transit, in storage, and while on the market; also the effect of ethylene and other gases in coloring fruits and vegetables. Methods of removing spray residues are investigated. Studies have been made of storage conditions, especially relating to temperature, humidity, duration of storage period, and ripening conditions after removal, which produce optimum results for canning, fresh fruit utilization, or for other purposes. As a result some products of excellent quality have been obtained from types of fruit previously supposed to be unpromising for the purpose. Various other problems relating to handling, transporting, and storing perishable products are receiving attention.

Vast losses of fruits and vegetables occur in transit, storage, and on the market as a result of disease, freezing in transit, or other conditions adverse to the product. Investigations that include the history and condition of the fruit when shipped or stored, the temperature and other conditions during transit by rail, boat, or other means, and during storage and marketing periods are essential to get at the facts needed in correlating cause and effect. The removal of spray residues necessary to bring them within legal requirements of tolerance has presented complicated problems that are entirely beyond the facilities and ability of growers and shippers to solve for themselves. The use of ethylene and other gases in treating citrus fruits for the purpose of eliminating the green color in fruit that is commercially mature requires research to determine limits of usefulness of the process, methods of application, effect on the fruit, and other like factors, so that the growers, shippers, and the industry generally can take full advantage of its beneficial possibilities. The working out of storage and ripening details in handling Kieffer and other pears of the same type, that result in a greatly improved quality of fruit for canning and other purposes, should add very materially to the value of a type of fruit grown extensively and widely and which heretofore has had a relatively small value, in part because of its poor eating quality. These and other lines of investigations have aided and are continuing to aid very greatly in the handling of perishable products.

Investigations of Variety Suitability and Quality in Relation to Fruit and Vegetable Utilization.--This work includes the study of horticultural varieties of fruits and vegetables in relation to their suitability for various

standard methods of processing and manufacture to determine what varietal characteristics influence the appearance, palatability, and food value of the product, with view to developing by breeding and selection improved types that will furnish superior products; to study in the case of a particular variety the effect of varying storage and environmental conditions and cultural practices on its suitability for processing, on the quality of the product, and on the composition of the raw and processed product; to conduct such physiological and related biophysical and biochemical studies as are necessary to determine differences in suitability of the crop materials for processing and in quality of the products.

The best figures available give the aggregate value of "canned and processed vegetables and fruits, and pickles, preserves, jams, jellies, and sauces, all industries," for 1929, as $721,845,902. The corresponding figure for 1931 is $481,416,068, a difference of a little over 33 percent between these two seasons. Even in seasons of comparatively light packs the quantity of fruit and vegetable products preserved by canning, freezing, and in other ways is impressive. Experience in the past has shown that improvement in appearance and quality of the pack increases consumer demand and widens the markets for such products, with consequent benefit to the growers of the raw materials. Varietal characters, stage of maturity, and factors of growth have a direct bearing on the appearance, palatability, and food value of the preserved products. The most profitable utilization of fruits and vegetables must be based on the suitability of different varieties for the particular method of processing or manufacture.

(1) GENETICS AND BIOPHYSICS

Appropriation Act, 1936	$31,675
Budget Estimate, 1937	31,675

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Genetics and biophysics investigations..	$30,537	$31,675	$31,675
Unobligated:			
Savings	40	- -	- -
Total	30,577	31,675	31,675

WORK DONE UNDER THIS APPROPRIATION

The work under this appropriation includes studies of the mechanism of inheritance, by which characters are transmitted from one generation to the next; exploration of the possibilities of inducing new characters by various kinds of radiation, such as the X-ray, heat, and light; and investigation of the possibility of influencing the growth of plants by modifying certain elements of the environment, with special reference to electric potential, light of specified wave lengths or colors, etc. The investigations are carried on in the laboratory and in the field on rented land at Lanham, Maryland, and at field stations operated by other divisions of the Bureau.

The justification for this work lies in the importance of a thorough knowledge of the mode and the mechanism of inheritance as a guide to developing methods for the improvement of plants by breeding, producing entirely new forms of plants that might have useful characters, and determining the interaction of plant growth with electrical, photoelectrical, and other radiation. The results achieved in previous years have made valuable contributions to a knowledge of heredity of importance to an understanding of plant breeding. Results also have been obtained on the effect of light of different wave lengths on germination of seeds that has made understandable certain problems in this field. Other earlier accomplishments have been equally valuable in providing a sound scientific basis for discountenancing the exploitation of certain electrical treatment procedures and other fantasies, with resultant savings to innocent individuals who otherwise might have been investors.

(m) MYCOLOGY AND DISEASE SURVEY

Appropriation Act, 1936	$42,818
Budget Estimate, 1937	42,818

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Investigations, identification, and collection of fungi	$15,395	$16,029	$16,029
Plant disease survey.	21,435	22,263	22,263
Mushroom investigations	4,290	4,526	4,526
Total obligations.	41,120	42,818	42,818
Unobligated:			
Legislative impoundments.	665	- -	- -
Other amounts unobligated	184	- -	- -
Total.	41,969	42,818	42,818

WORK DONE UNDER THIS APPROPRIATION

General.-- The work under this appropriation includes the collection and study of plant parasites and other fungi, surveys of plant diseases in the United States, and investigations on the culture and diseases of mushrooms.

Investigations, Identification, and Collection of Fungi.-- This project is concerned with the identification of fungi of all groups for Federal and State workers, students, teachers, and the general public; with supplying information on fungi to those interested; with the preparation of detailed studies of various fungus groups as a basis for routine identifications; and with the upbuilding and maintenance of a representative collection of the fungi of the world for reference and study purposes. Special problems include the study of fungi attacking insects, of poisonous and edible field and forest mushrooms, and of parasites of destructive fungi, as well as the comprehensive indexing of the literature on plant diseases and fungi in general, in cooperation with the Plant Disease Survey. A fungus exchange service is maintained both as a means of securing new and valuable material for the national collection and to supply workers in the State experiment stations and elsewhere with specimens needed for research or instructional work.

This project operates as a national service unit along the above lines, and the extent of the identifications and requests for fungus information supplied reaches a total limited only by the size of its staff. The fungus collection now totals over 300,000 specimens, with supplementary collections of photographs, microscopic preparations, and necessary covering indexes, and is one of the largest and most comprehensive of its kind in the world.

Plant Disease Survey.-- Work under this project consists of collecting by means of surveys and through cooperation with State institutions and other agencies current information as to the occurrence, prevalence, rate of spread, and seasonal and geographical distribution of plant diseases in the United States, and the losses caused by them, as well as the appearance of new and dangerous diseases or epidemics and unusual outbreaks of diseases. Files are maintained in which the information, in permanent and accessible form is always available to plant pathologists and economists and others to whom they are of value. In cooperation with the Mycology projects, a file of plant-disease literature of the world is maintained. By means of a mimeographed periodical, current information on the status of plant diseases in the United States is distributed to plant pathologists in this country and abroad.

The work of this project is all national or broadly regional in scope. It is noncompetitive and organized on the basis of cooperation with and services to the State and Federal workers in the field of its activity. It functions as a clearing house for information on plant diseases and is the only agency in the country which attempts to study the significance of plant diseases and the factors which regulate outbreaks on a material basis. More than 150 State experiment station workers from every State in the Union are included in the list of voluntary official collaborators served by the Survey and whose reports are recorded, preserved, summarized, and distributed to interested persons and agencies currently through the project's periodical and privately

through correspondence or the courtesy of the files as the occasion may arise.

Mushroom Investigations.-- This project is concerned at present with improvements in cultural practices and sanitary procedure in mushroom houses; with studies in the life history, behavior, and control of the "truffle" disease and other destructive mushroom troubles; with the development of new noncompetitive mushroom industries through work to establish in the United States cultivation of the European truffle and the Japanese mushroom and to grow under artificial conditions the Morel and other desirable wild types; with studies to establish fundamental principles in the physiology and genetics of mushrooms and the interrelation of aeration, temperature, and other factors in mushroom compost heaps and related problems as direct aids to the industry.

The mushroom industry of the United States represents a capital investment of approximately $15,000,000, with annual gross receipts from mushroom products of about $5,000,000. In close connection with this industry, this project has developed improved cultural practices and disease-control methods so as to lower production costs. It is also concerned with the development of similar industries through cultivation of other edible fungi (i. e. the truffle, a $6,000,000 industry in France). Popular interest is shown by the sending out in one year of over 50,000 copies of publications on mushroom culture and diseases. Other definite results have been the development of an artificial compost to replace horse manure, when such a step is necessary, and the control of the "bubbles" disease.

(n) NATIONAL ARBORETUM

Appropriation Act, 1936	$19,307
Budget Estimate, 1937.	34,307
Increase.	15,000

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)	Increase
Obligated:				
National Arboretum-maintenance of existing planted areas.....	$4,284	$4,307	$4,307	- - -
National Arboretum-preliminary planning and designing.....	- - -	5,000	5,000	- - -
National Arboretum-preliminary development.....	- - -	10,000	15,000	+ $5,000 (1)
National Arboretum-soil survey	- - -	- - -	5,000	+ 5,000 (2)
National Arboretum-new nursery development.....	- - -	- - -	5,000	+ 5,000 (3)
Total obligations.....	4,284	19,307	34,307	+ 15,000
Unobligated:				
Savings.....	30	- - -	- - -	- - -
Total.....	4,314	19,307	34,307	+ 15,000

The increase of $15,000 for 1937 includes:

(1) An increase of $5,000 for preliminary development of the Arboretum. This increase is requested in order to obtain more technically trained personnel than is available under the present allotment of funds for carrying out the preliminary development of the National Arboretum. The present allotment of $10,000 is being expended for materials, labor, and primary execution of preliminary plans.

(2) An increase of $5,000 for the preparation of soil survey maps. These are absolutely essential to the best planning and utilization of the land within the National Arboretum. While the general character of the soil is known in its gross features, a more accurate knowledge of the soil types and depths will make for a more successful utilization of the areas in planting.

(3) An increase of $5,000 for new nursery development, for the maintenance and propagation of plant materials to be used in permanent planting in the Arboretum. On account of the limited facilities for protecting nursery planting from trespassers, this sum should be made available for use either at the National Arboretum site or at the Bell unit of the Beltsville Research Center.

WORK DONE UNDER THIS APPROPRIATION

The National Arboretum was authorized by Congress in an Act approved March 4, 1927 (Public No. 799, 69th Congress) for research and education concerning tree and plant life. A total of 385 acres has been purchased. The Arboretum in its final development will contain living examples of all species of woody plants suited to outdoor cultivation in this region that will furnish the basis for breeding studies with woody plants and ecological studies, as well as botanical work. It will provide also such library, herbarium, office, greenhouse, and nursery facilities as may be needed to carry out the scientific studies. Under this appropriation routine maintenance operations are conducted on the National Arboretum. A large amount of land still remains to be cleared and land already cleared should be prepared for planting. Collections of material now on the ground must be maintained and prepared for planting to prevent their total loss. This appropriation covers only bare maintenance and does not permit progress on plans for substantial development.

EMERGENCY FUNDS

Direct Allotment

Projects	Obligated, 1935	Estimated obligations, 1936
Public Works Allotments (National Industrial Recovery Act):		
National Arboretum:		
Detailed survey of National Arboretum area and preparation of large-scale map	$3,489	---
Acquisition of lands for Arboretum	6,511	$748
Total	10,000	748

(o) NEMATOLOGY

Appropriation Act, 1936	$43,961
Budget Estimate, 1937	43,961

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Plant parasitic and related nematode investigations	$39,281	$41,761	$41,761
Investigations on nemic parasites of insects and other invertebrates	1,613	2,200	2,200
Total obligations	40,894	43,961	43,961
Unobligated:			
Legislative impoundments	50	---	---
Other amounts unobligated	1,571	---	---
Total	42,515	43,961	43,961

WORK DONE UNDER THIS APPROPRIATION

General.--It is widely known that parasitic nematodes or threadworms are the cause of numerous diseases in man and domesticated animals (hookworm, Ascaris, Trichina, etc.). It is not often realized, however, that numerous nematode species also parasitize lower animals (such as insects, millipeds, spiders, snails, etc.) or prey on plants (living in or on their roots, stems, leaves, flowers, or seeds) or live more or less free (thousands of species) in the soil and in fresh and marine waters. These nematodes, most often invisible to the naked eye because of their small size, interfere in many ways with human activities. They are the cause of some of the worst crop diseases, such as root-knot, which today is known to affect some 900 different kinds of plants, including a large portion of our most valuable crops (cotton, tobacco, Irish and sweet potatoes, tomatoes, lettuce, peach trees, grape vines, etc.) and ornamental plants, - even various forest trees. There is the so-called sugar-beet nematode, a very dreaded pest, which attacks some 200 different hosts, formerly known mainly as the cause of "beet tiredness" or "beet sickness" of the soil but recently the subject of very drastic measures in various potato-growing regions of Sweden, Great Britain, and Germany. Then, there may be mentioned the bulb or stem nematode, a species also known to attack some 250 different host plants and in some cases very detrimentally, e.g., narcissus bulbs, alfalfa, clover, sweet potatoes, and Irish potatoes. This form is subject to quarantine (No. 62). Another form, the strawberry nematode, is principally known as the causative agent of strawberry dwarf or crimp but also attacks a wide variety of plants, especially ornamentals such as begonias, ferns, and chrysanthemums. Other outstanding nematode pests of plants are the wheat nematode (the cause of cockle ears), the citrus nematode, the meadow nematode, the burrowing nematode (mostly on tropical and subtropical plants like sugarcane, coffee trees, etc.), and numerous forms which are less important or little known at present.

Except where they attack useful insects such as bees, bumblebees, etc., the insect parasitic nematodes are thought to be one of nature's means of keeping insect and similar pests in control. In regions where grasshoppers never develop into damaging swarms, it is thought that parasitic nematodes of the group known as mermithids (sometimes called "hairworms" or "horsehair snakes") are the main natural controlling factor. These mermithids, however, require certain climatic and moisture conditions for their proper development and are therefore unable to exist in the semi-arid regions where grasshopper plagues regularly occur.

Work of this character is of a highly specialized type, necessitating detailed training for the investigator. There are few such specialists, so that most State and private agencies must rely on the Division of Nematology as the sole agency from which to obtain information as to the possibility that a given disease may be caused by nematodes and advice as to procedure and control.

Plant Parasitic and Related Nematode Investigations.--Each year activities under this project cover the examination and correspondence relating to six to eight hundred samples of plant and soil material and numerous inquiries pertaining to nematode diseases of plants and the significance of soil-inhabiting forms for crop production and soil fertility. Such problems are presented as the significance of forms found in deteriorating lumber,

or in freshwater filter beds, or in vinegar, or in animal skins during the tanning process, etc. Planned research activities comprise investigations into the life habits and development of the following plant parasitic forms: Root-knot nematode, sugar-beet nematode, bulb or stem nematode, and strawberry nematode. The following control methods are being investigated: Crop rotation for the various nematode pests and their regional application; cultural control such as early planting, frequent cultivation, submersion and fallowing; seeking and testing nematode-resistant crop plants and ornamentals; breeding resistant varieties of susceptible crops; testing chemical and other soil disinfection methods; and developing therapeutical methods to cure infested plants by killing the nematodes without harming the plants through hotwater, vapor heat, vacuum treatment, or chemical therapeutics (iodine, etc.).

To estimate the savings resulting from these activities is difficult. They touch home gardens as well as large-scale crop production and cover items such as these: A truck gardener is informed how to again grow healthy carrots instead of his knotted, unmarketable, root-knot-infested crop; a greenhouse man is told how his unmarketable, leafless begonias can be cured by controlling the strawberry nematode; a real-estate company is informed how by proper procedure they may avoid further losses to shade trees affected by nematodes in their city development. The yearly savings through the activities under this project amount certainly to more than ten times the amount of the whole appropriation.

Investigations on Nemic Parasites of Insects and Other Invertebrates.-- Activities under this project include the examination of and correspondence relating to some fifty to eighty sample collections of nematodes parasitic in lower animals, such as snails, earthworms, and insects (barkbeetles, Japanese beetle, mosquitoes, gypsy moths, grasshoppers, etc.). Such collections are submitted for information regarding the possible significance of the parasites as natural enemies of these pests. Investigations on the taxonomy, life history, and economic significance of the mermithids, forms known particularly as grasshopper parasites, are now being prepared for publication.

Colonization of mermithids to control grasshoppers in regions where grasshopper outbreaks occur regularly as yet have not been successful. The results obtained through these investigations, however, are of great scientific value since they add a new page to our knowledge of how nature controls the ravages of insect and similar pests in certain regions.

A group of very efficient insect parasites (the Neoaplectanas) was recently discovered attacking the larval stages (soil phase) of such pests as the Japanese beetle, alfalfa weevil, fall army worm, spotted cutworm, house fly larva, corn earworm, etc. Experiments are showing that these parasites may be raised in large numbers on artificial media for colonization purposes, and it is hoped that methods can be developed by which these parasites may be used as an efficient factor in the control of these pests.

(p) PLANT EXPLORATION AND INTRODUCTION

Appropriation Act, 1936.	$204,483
Budget Estimate, 1937.	204,483

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Plant exploration and collection.....	$56,458	$54,606	$54,606
Field testing of introduced plants....	137,871	128,969	128,969
Plant geography and bibliographic investigations.....	19,980	20,908	20,908
Total obligations.....	214,309	204,483	204,483
Unobligated:			
Legislative impoundments.....	175	- - -	- - -
Other amounts unobligated.....	6,270	- - -	- - -
Total.....	220,754	204,483	204,483

WORK DONE UNDER THIS APPROPRIATION

General.--This Division serves as a cooperative and coordinating agency for securing from all parts of the world new, rare, and promising plants that may be useful in the development of new crop industries, directly for the diversification or expansion of economic needs, or as material to be used by plant breeders, especially as related to the development of disease- and insect-resistant crops. Initial protection is provided against the introduction of foreign insects and diseases and preliminary propagation and tests are conducted at four widely separated field stations. Cooperation is maintained with crop specialists in the U. S. Department of Agriculture, State agricultural colleges and experiment stations, botanic gardens, arboreta, nurserymen, and with selected lists of specially qualified private individuals. Studies are conducted of potential crop plants and of soil and climates of foreign countries as compared with this country, with a view to obtaining materials for introduction most adapted to our needs.

This Division is now generally recognized as the clearing house through which needed plant material is most effectively received. It is also recognized in this country and abroad as the most effective agency in exchanging and forwarding American plant material to foreign research workers, and results obtained have been so effective that its organization and procedure have been studied by other countries as a basis for the establishment of similar organizations. Introductions obtained by exploration and through contacts built up with foreign research workers, nurserymen, botanists, explorers, and plantsmen, as well as our own consular officers and commercial and agricultural attaches, have developed into important crops having a high economic value in our domestic agriculture.

Plant exploration and collection.--Foreign explorations are carried on by agricultural explorers for the purpose of receiving new and promising types of plants superior to those now grown in this country or having promise in aiding in the development of new crop industries and further advancing our agricultural and horticultural interests through breeding, development of disease-resistant crops and meeting the changes in shifting economic needs, as well as contributing to such broad problems as erosion control, range improvement, and beautification of the home and its surroundings. As an adjunct to field operations, worldwide exploration work is carried on through correspondents and collaborators in foreign countries, having in view the same objects and purposes.

Since this work is carried on with a view to aiding agriculture in all parts of the country, it is widely regional. Important grain introductions include varieties of wheat, barley, rye, oats, rice, and grain sorghums which have become standard over wide areas of our grain-growing regions. Forage introductions of varieties of alfalfa, soybeans, lespedezas, grasses, and vetches include many which have become an indispensable part of our agriculture. One cotton variety, the Acala, has been developed into the single variety of importance around which the cotton industry of the Southwest largely centers. While results in the field of horticulture are slower because of the long-time nature of most of the crops, certain introductions of citrus fruits, avocados, and nectarines have become commercially important crops and other introductions have been of material assistance to breeders in the development of new varieties and disease- and insect-resistant root stocks.

Field testing of introduced plants.--Experimenters' service activities under this appropriation include the widespread regional testing of all introduced plant material, with a view to determining its adaptability to the soils and climates of this country. This is accomplished by means of organized cooperation with crop specialists of the United States Department of Agriculture, State agricultural colleges and experiment stations, botanic gardens, and arboreta, together with selected lists of nurserymen and private individuals. Similar tests and experiments are carried on at four special plant-introduction gardens so located as to receive widespread regional effects of soil and climate.

This work is an essential part of plant introduction. Before extensive cultivation of introduced plants can be advised, reliable information must be obtained concerning their adaptability and their potential value to American agriculture and horticulture. This information can be obtained only by means of widespread field tests. A vital activity of this service is to prevent the bringing in of new insect pests or diseases incident to the introduction of plant material. Special facilities for growing and propagating under quarantine and detention under rigid control are utilized for this purpose.

Plant geography and bibliographic investigations.--Studies are made of the relation of crop distribution to climatic and soil conditions and of the important problems of plant introduction from a geographical point of view for the purpose of locating foreign sources of potentially valuable crops and to insure that such crops, when introduced, will be provided with soil and climatic conditions suited to their needs. This work is essential to the development of a proper and intelligent background for plant introduction and

the necessary testing work connected therewith. Its purpose is to chart the field in advance so that a minimum of time and effort will be lost in the search for new crops and the proper placing of these crops for experimental use. Unless adequate plans are made in advance through this project, much of the efficiency of the introduction procedure will be lost.

(q) PLANT NUTRITION

Appropriation Act, 1936.	$16,024
Budget Estimate, 1937.	16,024

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Plant nutrition investigations, including effects of length of day on growth.	$15,557	$16,024	$16,024
Unobligated:			
Legislative impoundments.....	50	- - -	- - -
Other amounts unobligated.....	47	- - -	- - -
Total.....	15,654	16,024	16,024

WORK DONE UNDER THIS APPROPRIATION

The great variation in influence of certain crops on both yield and quality of succeeding crops in the rotation system is particularly important. Plant nutrition investigations are directed toward the determination of the extent and significance of the influence of these variations, particularly on yield and quality of crops included in the rotation, and include the relative plant-food requirements of the crops in the rotation system. Laboratory and field investigations are conducted to determine which of the chemical elements are essential for normal plant growth and the functions of these elements in the nutrition of the plant, with special reference to elements required only in very small quantities. Studies are also made of the effect of length of day on growth, development, and composition of plants, including effects of daily duration, the intensity, and the color or composition of the light. The work is carried on with the same personnel as those engaged in Tobacco Investigations.

The practical importance of the cropping system on yield and quality of crops is illustrated by recent field trials in which a weed fallow preceding tobacco has consistently raised the market value of the tobacco crop from an average of $125 to approximately $375 per acre because of remarkable improvement in yield and especially in quality of the leaf. Other crops also may be greatly affected by the rotation system. The nutrition studies are demonstrating that for many important soils it is necessary to include in the fertilizer mixtures materials which will supply certain chemical elements not previously

considered, such as magnesium, calcium, sulphur, and boron. These results have an important bearing on the correct use of the new highly concentrated fertilizer materials. Discovery of the remarkable effects of seasonal and latitudinal change in length of day on the growth and the flowering and fruiting of plants is being effectively applied to the production of seed of certain varieties of tobacco under shortday conditions in the South, while the crop of commercial leaf is grown in northern latitudes where seed cannot be produced because of the long days. The principles are now being found to largely govern the northerly or southerly range of the different varieties and strains of various crop plants. They are also finding practical application in the commercial production of certain flowers, such as chrysanthemum, several weeks in advance of their normal season by shading to shorten the day length. This method of hastening and controlling time of flowering is being extensively used in the production of new varieties of crop plants by breeding.

(r) PLANT RESERVE STATIONS

Appropriation Act, 1936.	$483,198
Transferred to Soil Conservation Service, 1936.	-483,198

Note:- Under the provisions of Sec. 5 of the Act of April 27, 1935, this item was transferred to the Soil Conservation Service for the fiscal year 1936. It is omitted as a separate item in the Budget for 1937, continuation of the work being provided for in the estimates for the Soil Conservation Service.

(s) RUBBER AND OTHER TROPICAL PLANTS

Appropriation Act, 1936.	$46,749
Budget Estimate, 1937.	46,749

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Rubber production and breeding investigations.....	$19,579	$20,049	$20,049
Miscellaneous economic tropical crop studies, including coffee, cacao, coconut, papayas, oil palms, bananas, and other minor crops of potential importance.....	25,909	26,700	26,700
Total obligations.....	45,488	46,749	46,749
Unobligated:			
Legislative impoundments.....	50	- - -	- - -
Other amounts unobligated.....	32	- - -	- - -
Total.....	45,570	46,749	46,749

WORK DONE UNDER THIS APPROPRIATION

Under this appropriation experiments are conducted bearing on the introduction into cultivation of foreign and native plants of potential value in the production of rubber, and on the acclimatization and adaptation of various tropical crop plants to tropical regions of the United States. Studies are conducted with such crop plants as cacao and coffee. The most important investigations of ornamentals are those with palms. Plantings are maintained in southern Florida, and selections are made of species and strains which are adapted to the warmer regions of this country. Rubber investigations involve the study of both foreign and native plants containing rubber and the selection of high-yielding strains and experiments on methods of rubber extraction.

Investigations of tropical plants are essential to the establishment of new crops and ornamentals in the South. Experiments and tests conducted at plant-introduction stations have resulted in the selection of a large number of tropical plants adapted to cultivation in the South, and other plants now being tested have shown promise of being valuable additions to south tropical horticulture. Rubber investigations constitute the most important phase of tests now under way. Over half of the world's output of rubber is consumed in the United States. No other commodity which is not produced in commercial quantities inside our borders is of more importance in our American life. Not only do we produce no rubber in important quantity, but the source of 90 percent of our rubber is thousands of miles away in the East Indies and may be cut off entirely either by economic manipulation or military mischance; or the price may be raised so high by restrictive combinations of producing areas as to compel us to pay a high premium to foreign investors. In case of war, our very existence might depend on assurable supplies of rubber. Also, actual or potential production of rubber in the United States would act as a curb to check foreign combinations formed to increase the cost of rubber artificially.

(t) SEED INVESTIGATIONS

Appropriation Act, 1936.	$67,293
Budget Estimate, 1937	67,293

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Seed testing investigations.....	$37,600	$39,054	$39,054
Federal Seed Act enforcement.....	27,211	27,989	27,989
International Seed Testing Congress, expenses to meet the share of the United States for the.....	250	250	250
Total obligations.....	65,061	67,293	67,293
Unobligated:			
Legislative impoundments.....	100	- - -	- - -
Other amounts unobligated.....	62	- - -	- - -
Total.....	65,223	67,293	67,293

WORK DONE UNDER THIS APPROPRIATION

General.--The Division of Seed Investigations protects the quality of seeds used in the United States through research and law enforcement.

Seed Testing Investigations.--The research work is planned to find means by which various crop and weed seeds similar in appearance may be separated and identified and to prepare descriptions and illustrations to make the work available to others; to determine the kinds of weed and other seeds which occur in agricultural seeds produced in different seed-producing areas of the world as an aid to determine the origin of particular lots of seed in relation to their adaptability for use in any given region; to study the physiology of seed germination and the procedure for testing seeds to indicate their plant-producing value, including those which require unusual treatment during the germination test; to determine the influence on the vitality of seeds of conditions of production and storage and of their movement from one climatic area to another having widely different humidity and temperature; to determine the length of time seeds will retain their vitality when buried in soil as related to weed distribution and weed eradication. As a result of these functions, it is now possible to definitely separate and identify most of the agricultural grasses, the vetches, and many of the Brassicas, as well as many other crop and weed species.

A comprehensive study of the foreign seeds found in red clover and alfalfa from various countries of the world is being prepared for publication. It is such knowledge, resulting from fundamental research, that has placed the sale of agricultural seeds on a definite basis and has made seed control possible.

Methods have been developed to hasten germination of seeds of many groups of cultivated plants where germination has been found difficult. These studies have dealt both with problems designed to advance our knowledge of the general principles of seed germination and with specific difficulties in the carrying out of tests of the viability of seeds. Continued emphasis has been placed on the primary importance of determining possible agricultural value when testing seeds for germination.

Preliminary results of the storage experiments already have revealed facts that should be of service in both foreign and domestic trade in seeds. One buried seed experiment has shown the ability of some seeds to remain for at least 30 years in the soil and then make vigorous plants. Another trial shows the ability of red rice to remain viable in rice fields for several years.

Seeds are examined to determine their kind, adulteration, freedom from other crop seeds and weeds, plant-producing power, and region of production. These examinations are made for investigators in the U. S. Department of Agriculture, various government purchasing agencies, State officials, farmers, and dealers in seeds. During the past year many tests have been conducted for such organizations as Soil Conservation Service.

Seeds to be exported are analyzed and certificates issued to exporters in compliance with the agreement of the International Seed Testing Association. In this connection, cooperative seed-testing laboratories are maintained

at Sacramento, California; Corvallis, Oregon; Lafayette, Indiana; and Columbia, Missouri.

Federal Seed Act Enforcement.--The import provisions of the Federal Seed Act regulate the quality of the more important forage crop seeds imported into the United States and indicate the general inadaptability of imported alfalfa and red clover. The interstate clause prohibits the interstate shipment of all seeds which are fraudulently misbranded.

Every lot of seed subject to the import provisions of the Federal Seed Act is sampled by the U. S. Customs Service, and all samples are tested, and only those meeting the requirements of the Act are permitted entry. The coloring of all imported seed of alfalfa and red clover is supervised. The result of the enforcement of the import provisions of the Act has been to keep out of the country seeds which are of low quality. The coloring provision for alfalfa and red clover has resulted in a nationwide agronomic trial of imported vs. domestic seed which has been carried on without cost. The common knowledge that, with certain exceptions, imported seeds of alfalfa and red clover are generally inferior has been one of the contributing factors in the reduced imports of the seeds of these two major forage crops.

The interstate clause of the Act insures each State protection against shipment into the State of fraudulently misbranded seed of any kind, the States themselves not having authority to prevent such shipment. The enforcement of this clause of the Act has been carried on in cooperation with State authorities and has resulted in prosecutions for the shipment of misbranded seeds of oats, rye, vetch, soybeans, cowpeas, clover, alfalfa, sorghum, and other seeds on account of misbranding as to origin, variety, adulteration, percentage of pure seed, and germination.

International Seed Testing Congress.--Under this project participation in the International Seed Testing Congress on the part of the United States is authorized to the extent of $250 annually. The Seed Testing Congress is endeavoring to set up international rules for testing seed to insure uniformity.

(u) SOIL-FERTILITY INVESTIGATIONS

Appropriation Act, 1936. . . . . $172,157
Budget Estimate, 1937. 172,157

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Soil-fertility investigations.....	$132,236	$134,107	$134,107
Cotton root-rot soil and fertilizer investigations.....	34,275	38,050	38,050
Total obligations.....	166,511	172,157	172,157
Unobligated:			
Legislative impoundments.....	1,200	- - -	- - -
Other amounts unobligated.....	617	- - -	- - -
Total	168,328	172,157	172,157

WORK DONE UNDER THIS APPROPRIATION

General.--Work under this appropriation consists of studies of soil fertility and fertilizer problems to develop an economical program of fertilizer practice which will enable the farmer to reduce his cost of production and produce crops of better quality. The work involves the study of the fertilizer requirements of different soil types for different crops and of the influence of the various fertilizer elements on the growth, maturity, yield, quality, and disease resistance of crops; biochemical soil and fertilizer studies on the relation of organic matter, green manure, and crop residues to soil fertility; cotton root-rot soil and fertilizer studies; and soil-improvement investigations in the sandhill section of the South. Knowledge of inherent soil fertility and the relative suitability of specific soil types to specific crops and knowledge of the particular fertilizers required to supplement natural soil fertility for certain crops are important factors in reducing cost of crop production. Moreover, every acre of crop soil is subject to depreciation and decreased efficiency if proper methods of maintenance are not followed, and this is a factor in conservation of invested capital as well as in cost of production.

Soil Fertility Investigations.--Under this project the fertilizer requirements of the principal soil types and agricultural regions are being determined for a number of important crops, including cotton, sugarcane, sugar beets, potatoes, truck crops, citrus fruits, pecans, and green manure crops, to determine the best fertilizer ratios, the most desirable kind and amount of each fertilizer ingredient to use, and the most economical rate of application. The work involves the establishment of field experiments on prominent soil types in cooperation with State experiment stations and leading farmers. Field laboratories are located at Houma, and Shreveport,

Louisiana; Orlanda, Florida; Albany, Georgia; Columbia, South Carolina; Chadbourn, North Carolina; Scottsbluff, Nebraska; and Davis, California; and field experiments are conducted in those States and in Maine, New York, New Jersey, Pennsylvania, Virginia, South Carolina, Ohio, Michigan, Montana, Idaho, Colorado, and Utah. Biochemical soil and fertilizer studies are made at Arlington Farm on the nature, quantity, and distribution of organic compounds in soils and their effect on biological activity, on the changes brought about in soil constituents by growing plants, and on the changes which fertilizer salts undergo in soils and their effects on plants, which researches are of fundamental importance in developing sound fertilizer usage. Soil-fertility investigations are designed to enable the farmer with the least possible outlay for fertilizer, to obtain the greatest net return for his work through reduction of unit cost and meeting the demands for better quality products.

Cotton Root-Rot Soil and Fertilizer Investigations.--Work under this project has for its objective the development of means for reducing losses resulting from root-rot of cotton. Over 9,000,000 acres in the Southwestern States are infested with root-rot. Work is carried on at the field station at Austin, Texas, and field fertilizer experiments are at present conducted in nine counties of the black-land belt of Texas. The work consists of field and laboratory studies to determine the influence of fertilizers and soil amendments on cotton root-rot, the chemical and physical difference between infested and non-infested soils, and the influence of cultural methods and crop rotations in conjunction with the use of fertilizers in the control of root-rot. The work is cooperative with the University of Texas and the Texas Experiment Station.

(v) SOIL MICROBIOLOGY INVESTIGATIONS

Appropriation Act, 1936.	$39,854
Budget Estimate, 1937.	39,854

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Soil inoculation investigations and inspection of cultures.....	$18,620	$19,000	$19,000
Soil population investigations in relation to crop production, bearing primarily on fungi, bacteria, algae, etc.....	19,582	20,854	20,854
Total obligations.....	38,202	39,854	39,854
Unobligated:			
Legislative impoundments.....	150	- - -	- - -
Other amounts unobligated.....	619	- - -	- - -
Total.....	38,971	39,854	39,854

WORK DONE UNDER THIS APPROPRIATION

Work under this appropriation includes tests and inspection of commercial cultures of legume nodule bacteria and of soil inoculants to insure that cultures sold to farmers are true to type, viable, and efficient for the purpose claimed. Research is also conducted on legume nodule bacteria in connection with the efficiency of strains, influences which alter their quality or interfere with their functions, methods of practical application, and the development of special strains for all legume crops, including those newly introduced into this country. Since the proper nitrogen-fixing bacteria must be applied to legume seed wherever the growing of a particular crop is extended into a new area, a tested collection of strains is maintained to aid in the establishment of new crops in cooperation with State experiment stations, county agents, and invidivual farmers. Other researches cover the decomposition of green manures, cover crops, and crop residues; the effect of soil reactions and soil treatments on the microorganism and their activity in the soil; studies of the organisms responsible for the decay of soil organic matter; and studies on the use of fungi and bacteria for determining fertilizer needs of soil. These investigations are planned to obtain a better understanding of the nitrogen economy of the soil and the relation of the micropopulation of the soil to different manuring and cropping systems, with the view to increasing the efficiency of farm practices.

(w) SUGAR-PLANT INVESTIGATIONS

Appropriation Act, 1936.	$312,079
Budget Estimate, 1937.	312,079

PROJECT STATEMENT

Project	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Sugar beet investigations.....	$199,541	$208,408	$208,408
Sugarcane investigations.....	98,957	103,671	103,671
Total obligations.....	298,498	312,079	312,079
Unobligated:			
Legislative impoundments.....	250	- - -	- - -
Other amounts unobligated.....	4,197	- - -	- - -
Total.....	302,945	312,079	312,079

WORK DONE UNDER THIS APPROPRIATION

General.--The work under this appropriation consists chiefly of research on the problems connected with the growing of sugarcane in continental United States, Puerto Rico, Hawaii, and the Virgin Islands and sugar beets and beet seed in the United States, including the control of diseases affecting these crops.

Sugar Beet Investigations.--Under this project superior yielding varieties of sugar beets are being developed, strains resistant to disease are selected for increase, types better adapted to conditions in this country are produced, experiments involving comparative studies of cultural practices are performed, and special methods for the control of curly-top and other serious diseases, including special investigations in cooperation with the Bureau of Entomology for the control of the curly-top disease of sugar beets transmitted by the leafhopper, are being studied. The sugar-beet industry is particularly interested in the investigations on field methods of controlling diseases and in the increase of seed supplies of disease-resistant sugar beets.

Sugar production from beets in continental United States has, by recent enactment, been stabilized at 1,550,000 tons. Approximately 1,000,000 acres in 18 States are used for beet growing, and in these States the crop is an important element in the cropping system. The capital investment in farm lands, farm equipment, irrigation systems, factories, factory equipment, and transportation and power facilities directly concerned in sugar-beet production and beet-sugar manufacture may be conservatively placed at $350,000,000. The capital investment in important subsidiary industries furnishing supplies and service to the beet industry and in the livestock industry directly concerned in utilizing sugar-beet by-products as feed would more than treble this figure. For the 1933 crop, the fabricated products, beet pulp, molasses, and refined sugar, had a value in excess of $127,000,000, and the sugar-beets were worth, on the farm, $58,000,000. The sugar-beet crop, in good years, has been a profitable crop for the farmer to grow. It should be even more favorably considered with a parity price to be paid farmers for sugar beets. The crop, however, because of ravages of disease, improper cropping practices, and soil depletion, has been an extremely hazardous one in many regions. A truly stabilized and safe beet agriculture can be secured only when the enormous losses to farmer and factory arising from disease epidemics and from inefficient crop practices are removed by the findings and application of agricultural research. Gratifying progress in the development of strains of sugar beets resistant to curly-top and leaf-spot (the principal diseases of beets) has been made, and one strain showing a measure of resistance to curly-top has been released for commercial culture. Strains of greater promise are in process of development and test, forecasting the eventual removal of these disease hazards, which take a toll of many millions of dollars every years and threaten the existence of a large proportion of the industry, with capital investments of over fifty million dollars. Successful fruition of work on disease-resistant strains of sugar beets will incidentally bring a new industry to American farmers--the commercial production of sugar-beet seed--the beginning of which, attributable entirely to this research, was started on a substantial basis in 1933, and in future years, if work is actively continued, will free American beet growers from the anomalous but traditional dependence on European seedsmen. (The California, New Mexico, Colorado, Minnesota, and Michigan Agricultural Experiment Stations, The Division of Soil Fertility of the Bureau of Plant Industry, the Carbohydrate Division of the Bureau of Chemistry and Soils, and the Division of Mechanical Equipment of the Bureau of Agricultural Engineering are cooperating in this work.)

Field stations and laboratories are maintained at the following points: Twin Falls, Idaho; Riverside, California; Fort Collins, Colorado; Salt Lake City, Utah; and Rocky Ford, Colorado. Field experiments are also conducted at stations at Davis, California; Las Cruces, New Mexico; Scottsbluff, Nebraska; St. Paul, Minnesota; East Lansing, Michigan; and Logan, Utah.

Sugarcane Investigations.-- These investigations include the study of sugarcane diseases, development of disease-control methods, and the breeding and testing of new varieties of cane to secure disease-resistant, higher-yielding commercial varieites better adapted to natural climatic and soil conditions. The sugarcane industry is particularly interested in the investigations on field methods of controlling diseases, the continued development of disease-resistant varieties looking toward minimizing the fluctuations in production, due to recurring disease hazards, and in the increase and distribution of seed supplies of the improved varieties as they are developed.

The project directly serves cane producers in eight States and Puerto Rico, who utilize about 490,000 acres of land for sugar production and more than 100,000 acres for sirup production. The welfare of approximately 1,000,000 people living in these cane-producing areas is directly or indirectly dependent upon the crop. About $330,000,000 are invested in land, transportation and milling equipment, implements, etc. Incidental service features of the activities in this project are extended to the sugar industries of the Territory of Hawaii and the Philippine Islands, which have combined capital investments of about $350,000,000. Outstanding progress has resulted from this work, the most striking example being the reconstitution of the Louisiana sugarcane industry by means of disease-resistant varieties of cane. The five-year average production of sugar reflecting the per acre yield of cane during the period 1924-28 dropped because of a recently introduced virus disease to 95,400 tons per year, compared with an average of 280,000 tons for the previous 20 years. Restoration to an average of 200,600 tons per year for the five years 1930-1934 is directly attributable to this research, and the outlook for complete restoration and more profitable conduct of this important industry and the cane sirup industries of the Gulf States seems dependent only on intensive prosecution of work under this appropriation. (The Puerto Rico, Louisiana, and Mississippi Agricultural Experiment Stations are cooperating in this work).

Field stations and laboratories are maintained at the following points: Canal Point, Florida; Houma, Louisiana; Cairo, Georgia; and Guayama, Puerto Rico.

(x) TOBACCO INVESTIGATIONS

Appropriation Act, 1936	$137,744
Budget Estimate, 1937	137,744

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Cigar binder and filler production investigations	$3,685	$5,717	$5,717
Flue cured tobacco production investigations	19,120	28,712	28,712
Burley tobacco production investigations.	7,005	9,435	9,435
Maryland tobacco production investigations	4,612	6,360	6,360
Dark air cured tobacco production investigations	2,105	2,400	2,400
Tobacco disease investigations	21,210	52,302	52,302
Breeding and growing high nicotine tobacco for use in insecticides . .	- -	10,250	10,250
Tobacco breeding and physiological investigations	15,426	22,568	22,568
Total obligations	73,163	137,744	137,744
Unobligated:			
Legislative impoundments	100	- -	- -
Other amounts unobligated	384	- -	- -
Total	73,647	137,744	137,744

WORK DONE UNDER THIS APPROPRIATION

Tobacco investigations include all phases of growing, curing, and handling tobacco, with the exception of tobacco insects and their control and tobacco marketing. The work consists of studies on tobacco diseases and their control, laboratory research on causes of poor quality in leaf tobacco, and field investigations in the improvement of tobacco varieties and methods of fertilization, growing, curing, and handling the different types of leaf, as each distinctive type of tobacco presents special cultural problems. Development by breeding of milder types of leaf having a reduced content of nicotine is a feature of the work, as are also the development of high nicotine tobaccos for use as raw material in the production of insecticide and the determination of best cultural methods for maximum production of nicotine. The primary aims are to increase the average quality of the tobacco produced and to reduce the hazards and heavy losses encountered in the culture of the crop. Cooperative experiments are

carried on at the agricultural experiment stations of tobacco-growing States, namely, Connecticut, Georgia, Maryland, Massachusetts, North Carolina, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin, but no independent field stations are maintained.

Correct methods of fertilization are of outstanding importance in producing high-quality tobacco, and recent changes and trends in the production and use of fertilizer materials have created urgent need for information as to the adequacy and limitations of the newer materials in the fertilization of the different types of tobacco. Results already obtained concerning the necessity of supplementing the highly concentrated fertilizer materials with magnesium and certain other elements have strongly emphasized the importance of these problems, and the necessary information can be obtained only through extensive field and laboratory studies. It is essential also that cropping systems best suited to production of leaf of high quality be determined. Due to the appearanc of new diseases and the spread of older troubles, tobacco growers are suffering steadily increasing losses. The new blue mould or downy mildew constitutes a grave hazard over the greater portion of the tobacco-producing area, and it is especially important to further develop control measures by regulation of temperature and humidity in the seed bed. In the Burley areas, in which 500,000 acres of tobacco are grown, most growers suffer damage from the black root-rot disease. In 1933 hundreds of acres of tobacco in Pennsylvania were practically ruined by the wildfire disease. Mosaic disease is widely prevalent in Maryland and other producing areas. Although definite progress has been made in developing control measures, much additional work is required, especially on some of the newer disease problems. Increase in the available supply of nicotine for insecticidal purposes at reasonable cost appears to be a matter of special importance at the present time, especially in connection with the spray-residue problem. There is urgent need for improvement in present methods of curing to eliminate serious losses incurred with Burley and other air-cured types.

(y) WESTERN IRRIGATION AGRICULTURE

Appropriation Act, 1936	$122,527
Budget Estimate, 1937	122,527

PROJECT STATEMENT

Projects	1935	1936 (Estimated)	1937 (Estimated)
Obligated:			
Crop production investigations on irrigation projects	$83,335	$90,730	$90,730
Quality of irrigation and drainage waters, investigations of	34,596	31,797	31,797
Total obligations	117,931	122,527	122,527
Unobligated:			
Legislative impoundments	100	- -	- -
Other amounts unobligated	1,139	- -	- -
Total.	119,170	122,527	122,527

WORK DONE UNDER THIS APPROPRIATION

General.-- Under this appropriation the Bureau of Plant Industry is conducting investigations, independently and in cooperation with the States and other bureaus of the Government, in the irrigated areas of the western United States, to determine what crops and what crop rotations are best suited to the several regions, what constituents and concentrations of salts in irrigation and subsoil waters are injurious to crops, and how such injury may be minimized or prevented. The work of the Division is conducted under two projects, as follows:

Crop Production Investigations on Irrigation Projects.-- The work under this project is prosecuted at seven field stations. Six of these are conducted in cooperation with the States of Nevada, Oregon, Washington, Montana, South Dakota, and Nebraska. The work at these field stations consists of tests of varieties of field crops, an extensive and long-continued series of crop rotations, experiments in pasturing crops with livestock, and experiments in the use of manures and fertilizers. The fundamental objective of all these experiments is to determine what crops and what methods of crop production and utilization are best adapted to the respective areas and will best maintain the productivity of the irrigated lands. The field stations operated on the irrigated lands serve cooperating divisions of the Bureau of Plant Industry, as well as divisions of other Federal Bureaus and research and demonstration agencies supported by the States, (Bureaus of Animal Industry, Dairy Industry, and Agricultural Engineering cooperating).

Quality of Irrigation and Drainage Waters.-- The work under this project is conducted at two field laboratories--one at Riverside, California, and one at Fallon, Nevada. It is cooperative with the States of California and Nevada, with the Bureau of Reclamation, the Geological Survey, the International Boundary Commission (United States and Mexico), and with various irrigation districts. The investigational work consists of collecting and analyzing samples of irrigation, drainage, and underground waters to determine what constituents and what concentrations of these constituents are causing crop injury or impairing the physical condition of the soil, to determine the sources of the contamination of irrigation supplies with such highly injurious substances as the compounds of boron and chlorine, and to devise means for minimizing or preventing such contamination. The fundamental objective of these investigations is to protect and maintain the productivity of irrigated lands.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1935	Estimated obligations, 1936
Agricultural Adjustment Administration (Advances to A.A.A.):		
Transfer of funds for assistance in preparation of codes and market agreements in connection with agricultural adjustment programs	$2,495	---
Public Works Allotment (National Industrial Recovery Act):		
Spray-residue investigations: Conduct of agronomic studies of crops which furnish nonpoisonous spray materials	31,290	$2,350
Physical improvements at various field experiment stations, etc. (completion of work begun in 1934):		
Painting and repairing buildings, Indio, Calif....	10	---
Repair of greenhouse and heating plant, La Jolla, Calif. (Torrey Pines)	43	---
Air conditioner in greenhouses, La Jolla, Calif. (Torrey Pines)	1,645	---
Remodeling propagation equipment, La Jolla, Calif. (Torrey Pines)	11	---
Greenhouse construction, Riverside, Calif.....	7,971	---
Repairs to several buildings, Fort Valley, Ga. ...	21	---
Constructing coal pit, Fort Valley, Ga.....	17	---
Constructing garage, Fort Valley, Ga.	37	---
Constructing water lines and 4 wells, Beltsville, Md.	122	---
Erecting irrigation system, Beltsville, Md.	22	2
Constructing roads and walks, Beltsville, Md.	---	9
Reconditioning hotbeds, Beltsville, Md.	16	---
Installing electric power, Beltsville, Md.	2,800	---
Constructing sweet potato storage, Beltsville, Md.	26	---
Purchase of land formerly leased, Beltsville, Md.	1,634	73
Equipping staff laboratory and research building (all phases of horticultural research), Beltsville, Md.	111,125	400
10 greenhouses, heating equipment and headhouses (fruit and vegetable research), Beltsville, Md..	107,181	---
Propagating house, Beltsville, Md.	15	---
2 garages, Beltsville, Md.	1,834	---
Soil and fertilizer house, Beltsville, Md.	14	---
Repairing and painting buildings, Beltsville, Md..	33	3
Constructing 3 tool sheds, Beltsville, Md.	504	9
Foreman residence, Meridian, Miss.	16	---
Greenhouse, Willard, N. C.	4	---
Digging irrigation wells, installing pumps and ditches, and reconditioning station buildings, including new heating and bath equipment, Greeley, Colo.	---	2,500

EMERGENCY FUNDS--(Continued)

(2) Direct Allotments (Continued)

Projects	Obligated, 1935	Estimated obligations, 1936
Public Works Allotment (National Industrial Recovery Act) --Continued.		
Physical improvements--Cont'd.		
Painting building, Brownwood, Texas	$434	---
Repairing and oiling roads, Cheyenne, Wyo.	4,666	3
Establishment of a cotton breeding field station and seed farm in the Mississippi Delta	21,910	23,090
Constructing nut storage building and implement storage, Meridian, Miss.	1,946	---
Foreman's residence, Meridian, Miss.	1,658	---
Superintendent's cottage, Meridian, Miss.	6,405	---
Construction of greenhouse and headhouse, Meridian, Miss.	4,794	---
Construction of grape trellis, Meridian, Miss.	1,000	---
Construction of cold frames and hot beds, Meridian, Miss.	1,053	313
Sweet potato storage building, Meridian, Miss.	50	---
Construction of laboratory office building and sugarcane mill, equipped, Meridian, Miss.	14,238	397
Cold-storage and fruit and vegetable products building, equipped, Meridian, Miss.	46,072	---
Construction of roads and walls and landscaping of grounds, Meridian, Miss.	3,000	---
Providing land, buildings, and other facilities for cotton investigational work, North Carolina	46,167	1,702
Repairs and improvements to buildings, Willard, N. C.	95	---
Screen and lath houses, Willard, N. C.	765	---
Building roads and walks, erecting irrigation system, constructing water and tile drainage, Willard, N. C.	2,627	---
Providing land, buildings, and other facilities for investigational studies in cotton and cereal crops, Tennessee	44,484	4,517
Construction of artesian well, Newell, S. Dak.	19,970	20,000
Machine shed, sheep and lambing shed, buildings, and repairs, Newell, S. Dak.	1,700	27
Construction, equipment, and operation of a fruit-products laboratory on Government-owned land ground near Beltsville, Md.	136,467	3,033
Total, physical improvements	594,602	56,078
Total, Public Works Allotments (N. I. R.)	625,892	58,428

EMERGENCY FUNDS -- (Continued)

(5) Direct Allotments (Continued)

Projects	Obligated, 1935	Estimated obligations, 1936
Loans and Relief in Stricken Agricultural Areas (Emergency Appropriation Act, 1935):		
Transferred from Agricultural Adjustment Administration for survey and location of seed supplies and determination of suitable varieties for stricken agricultural areas	$88,303	---
Transferred from Forest Service for investigations relating to selection and determination of suitable trees and shrubs for planting in Great Plains shelterbelt	10,952	---
Total, Loans and Relief	99,255	---
Emergency Relief Appropriation Act of 1935:		
Physical improvements at field stations:		
Reconditioning and altering grape-production and pathology laboratory and office buildings, including the building and landscaping of roads and walks, Fresno, Calif.	---	5,000
Repairs and heating plant in field laboratory and implement storage building; digging deep well and constructing water distribution lines; construction of additional storage space, Medford, Oreg.	---	3,500
Drilling irrigation wells, installing pumps and ditches, Greeley, Colo.	---	8,000
Renovating buildings; cleaning grounds; repairing fences, and renewing water pipes, Big Spring, Texas.....	---	1,400
Repairs and painting of station buildings, Robson, Louisiana	---	1,000
Clearing and leveling land, and building storage shed, Willard, N. C.	---	3,700
Clearing and terracing land, installing of power lines, and extension of water system and storage supply, Meridian, Miss.	---	7,700
Renovating buildings, including repairs to foundations, patching plaster and stucco, painting, redecorating, etc.; cleaning up shelterbelt and grounds; repairs to roads and fences; grading land, U. S. Dry Land Field Station, Tucumcari, N. Mex.	---	2,000
Building roads and sidewalks to connect station buildings and field plots and installing measuring weirs and irrigation system, Indio, Calif.	---	2,800

EMERGENCY FUNDS--(Continued)

(2) Direct Allotments (Continued)

Projects	Obligated, 1935	Estimated obligations, 1936
Emergency Relief Appropriation--Continued:		
Physical improvements--continued.		
Constructing fireproof record room to keep valuable records which are constantly available to be used by investigators, Indio, Calif.	---	$3,500
Erecting fence to protect experimental plots from theft and stray animals; remodeling several buildings to make them more valuable for experimental work; altering and painting buildings, Indio, Calif.	---	4,900
Total, Emergency Relief	---	43,500
Total, Emergency Funds (Direct Allotments).	$727,642	101,928

EMERGENCY FUNDS -- BUREAU TOTAL

Summary

Projects	Obligated, 1935	Estimated obligations, 1936
Direct Allotments:		
Agricultural Adjustment Administration (Advances to A.A.A.): Assistance in agricultural adjustment programs	$2,495	---
Public Works Allotments (National Industrial Recovery Act):		
Physical improvements at various field experiment stations	594,602	$56,078
Spray-residue investigations	31,290	2,350
National Arboretum	10,000	---
Loans and Relief in Stricken Agricultural Areas (Emergency Appropriation Act, 1935):		
Transfer from Agricultural Adjustment Administration (location of seed supplies, etc.)	88,303	---
Transfer from Forest Service (shelterbelt work)..	10,952	---
Emergency Relief Appropriation Act of 1935 (physical improvements at field stations)	---	43,500
Total Emergency Funds (Direct Allotments)	737,642	~~101,928~~ 102,676

PASSENGER CARRYING VEHICLES

The authorization for purchase of passenger-carrying vehicles contemplates an increase of $3,150 ($15,675 in 1936; $18,825 estimated for 1937) for this purpose. As shown by the Budget schedule, the $18,825 authorization would permit replacement of 22 vehicles and the purchase of 12 additional vehicles. The replacements are needed in order to obviate the continued use of worn-out cars at excessive maintenance costs.

The work of the Bureau of Plant Industry is necessarily to a very large extent in the country, where transportation through the use of automobiles is essential to effective work. Automobiles can be obtained for the purpose by hiring commercial cars, by using personally owned cars of employees on the mileage basis, or by the purchase of Government owned cars. The latter method has been found to be the most economical in the work of the Bureau of Plant Industry, costing on the average about 3 cents per mile for light makes of cars. The purchase of additional cars included in these estimates will reduce the use of personally owned cars, which cost in the neighborhood of 5 cents per mile, and also the hire of commercial cars, which cost from 10 to 15 cents per mile.

All these automobiles will be used at points in the field incident to the conduct and supervision of experimental work. Specifically, 5 automobiles will be used on cereal work in the Northwestern and Southwestern States; 9 on cotton work in States in the Southeast and Southwest; 2 in shelterbelt work in North Dakota and adjacent States; 3 in forest pathology in Connecticut, North Carolina, New Jersey, and Ohio; 7 in fruit and vegetable crops and diseases investigations in practically every section of the United States; 3 in sugar-plant investigations in Louisiana, California, and Puerto Rico; 1 in tobacco investigations in North Carolina; and 4 in western irrigation agriculture in California, Nebraska, and Oregon.

BOUND BY
HNM